MYSTERY-ADVENTURE-ROMANCE

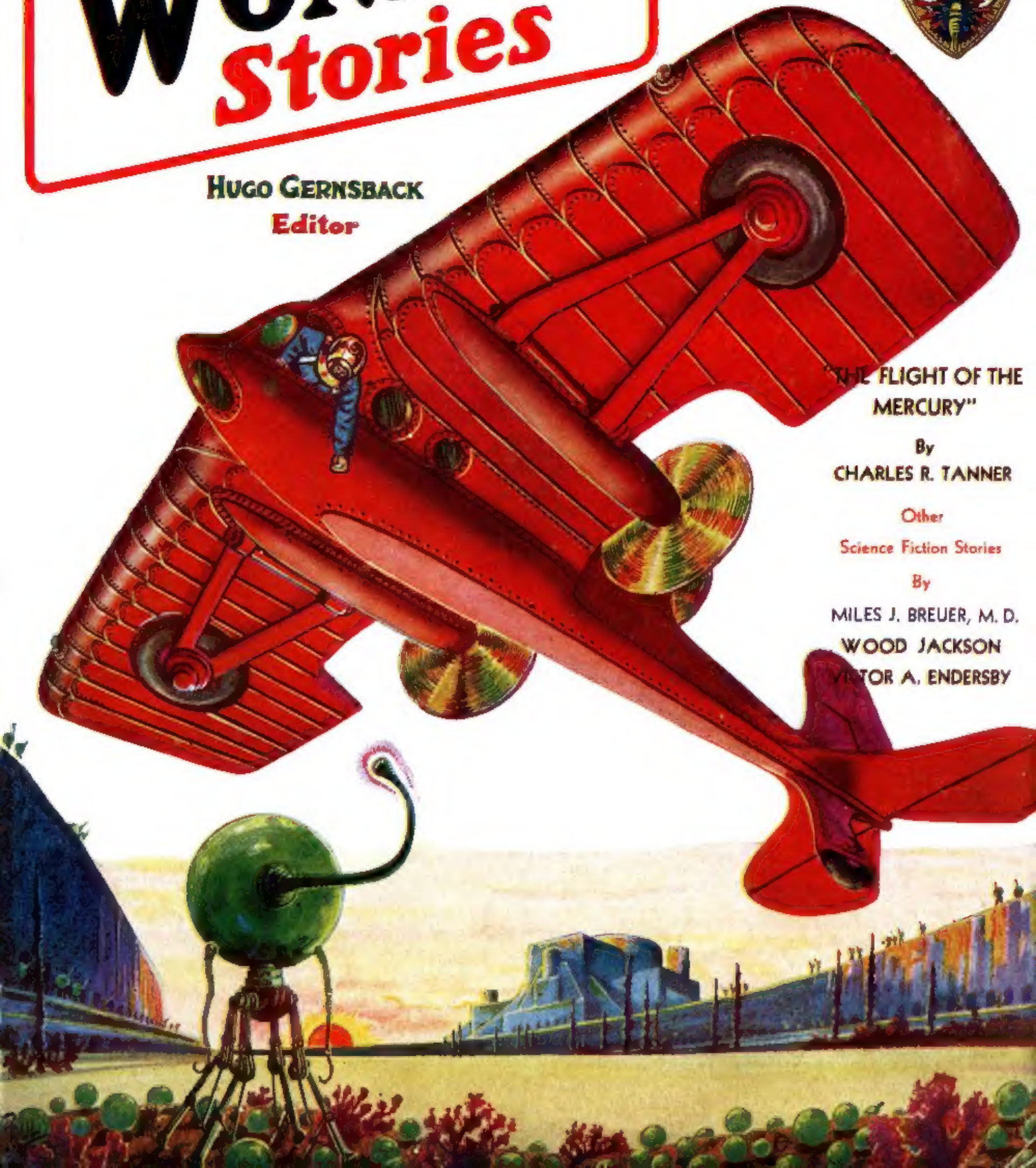
WONDER Stories

July

25 CENTS Canada 30¢

A GERNSBACK PUBLICATION

HUGO GERNSBACK
Editor



"THE FLIGHT OF THE MERCURY"

By
CHARLES R. TANNER

Other
Science Fiction Stories
By

MILES J. BREUER, M. D.
WOOD JACKSON
VICTOR A. ENDERSBY

GOOD JOBS *Right at Your Finger Tips*

WHEN YOU ARE R.T.I. TRAINED IN

RADIO-TELEVISION-*Talking Pictures*

BIG PAY JOBS! SPARE TIME PROFITS! A FINE BUSINESS OF YOUR OWN! They're all open to you and other live wire men who answer the call of RADIO. The fastest growing industry in the world needs more trained men. And now come Television and Talking Movies—the magic sisters of Radio. Will you answer this call? Will you get ready for a big pay job NOW and step into a BIGGER ONE later on? You can do it EASILY now.

R. T. I. Home Training Puts You In This Big Money Field

Radio alone, pays over 200 MILLION DOLLARS a year in wages in Broadcasting, Manufacturing, Sales, Service, Commercial Stations and on board the big sea going ships, and many more men are needed. Television and Talking Movies open up other vast fields of money-making opportunities for ambitious men. Get into this great business that is live, new and up-to-date, where thousands of trained men easily earn $60 to $100 a week—where $10,000 a year jobs are plentiful for men with training plus experience.

Easy To Learn At Home—In Spare Time

Learning Radio the R. T. I. way with F. H. Schnell, the "Ace of Radio" behind you is EASY, INTERESTING, really FUN. Only a few spare hours are needed and lack of education or experience won't bother you a bit. We furnish all necessary testing and working apparatus and start you off on practical work you'll enjoy—you learn to do the jobs that pay real money and which are going begging now for want of competent men to fill them.

Amazingly Quick Results

You want to earn BIG MONEY, and you want some of it QUICK. R. T. I. "Three in One" Home Training—Radio-Television-Talking Movies—will give it to you, because it's easy, practical, and is kept right up-to-date with last minute information. In a few weeks you can be doing actual Radio work, making enough EXTRA MONEY to more than pay for your training. In a few short months you can be all through—ready to step into a good paying job or start a business of your own. A BIG JOB—BIG MONEY—A BIG FUTURE. There is no other business in the world like it.

FRED H. SCHNELL
Chief of R. T. I. Staff

Twenty years of Radio Experience. First to establish two-way amateur communication with Europe. Former Traffic Manager of American Radio Relay League. Lieut. Commander U.S.N.R. Inventor and Designer Radio Apparatus. Consultant Radio Engineer. Now in charge of R. T. I. Radio Training—and you will like his friendly manner of helping you realize your ambition.

Investigate—Send For R. T. I. Book Now

Don't waste a minute. Find out what the great Radio Industry, which has grown faster than the Automobile and Motion Picture business, has to offer you. Find out what other men are earning. SEE HOW EASILY YOU CAN GET STARTED. Get the facts about Radio, Television and the Talking Pictures, first hand, in the big R. T. I. FREE BOOK. Learn what this R. T. I. "Three in One" Home Training can do for you. Mail the Coupon for FREE BOOK NOW.

Radio & Television Institute
Dept. 799
4806 St. Anthony Court, Chicago

R.T.I. *Training Brings Big Jobs Like These!*

Earned $500 Extra Money in Two Months

Your radio course has enabled me to earn over $500 in two months' spare time work. Understand that this is all spare time work, as I have a permanent position with my father in our store. I give you all the credit for the above and as I said before, I wish to finish the entire course as soon as I can.—Your student, J. NORDSTROM.
Greenville, Ky. R 1, Box 87.

Salary Raised 33 1-3% Since Enrolling

You may be interested to know that I am now Radio Service Manager for the H. N. Knight Supply Co. who are distributors for Westinghouse Radio Receivers in the State of Oklahoma, and Texas Panhandle, with an increase in salary of about 33 1-3%, since I enrolled with your school.

Thanking you for your interest you have shown in me, and your wonderful course, I am, EARL P. GOSSOM, 618 East 6th St., Oklahoma City, Okla.

Makes $25 a Day

Haven't forgotten you. How could I when I make as high as $25.00 per day and have made $600.00 in two months from Radio work. That's not so bad when I'm only 19 and in a small town. I just looked over the catalog you sent me before I enrolled, and you did about all you said you would and about as much more.—FLOYD KNIERLY.
R. F. D. 2, Box 91, St. Joe, Ind.

RADIO & TELEVISION INSTITUTE
Dept. 799, 4806 St. Anthony Court, Chicago

Send me Free and prepaid your BIG BOOK "Tune In On Big Pay" and full details of your three-in-one Home Training (without obligating me in any way).

Name.....

Address.....

City.....State.....

SCIENCE FICTION PLUS!

Have you ever seen a Grampite —or a hahoe? Have you ever imagined the fearful, wonderful adventures that might lie before the bold man who sought to conquer an Amazon queen on the planet Venus? You'll find a weird, new world of strange sights and thrills as your imagination soars to astonishing heights in this tale of life millions of miles away.

THE PLANET OF PERIL

By Otis Adelbert Kline

Suddenly transported by psychic wizardry to the beautiful and mysterious neighbor planet, Venus, Robert Grandon, who all his life had craved adventure, found it a'plenty.

Grandon was a fighter, and fighting ability was the price of life on Venus. His adventures with savage men, ferocious beasts, gigantic reptiles, enormous, blood-sucking bats and other horrible animals, follow in such quick succession that the interest in the story is at white heat all the time.

Then there is Vernia. Vernia, queenly, beautiful, and tyrannical, who led an army against Grandon. She won and she lost, but the losing brought her the greater joy.

For that vast army of men and women who love a tale that stirs the imagination, a tale of amazing adventure, of fearful and wonderful happenings, a tale the like of which has never been told before, this book has been written.

At positively no increase in price, the readers of WONDER STORIES may secure a genuine, first edition copy of "The Planet of Peril," autographed by its celebrated author, Otis Adelbert Kline. As this edition is very limited, we advise you to send in your money at once.

Stellar Publishing Corp. WS-7
96-98 Park Place
New York, N. Y.

Gentlemen:

I enclose $2.00 for an autographed, first edition copy of Otis Adelbert Kline's remarkable tale of Venus,

THE PLANET OF PERIL

Name.....

Address.....

City and State.....

It's a story with "a real kick,'

Publication Office, 404 North Wesley Ave., Mt. Morris, Ill.
Editorial and General Offices, 96-98 Park Place, New York City.
Vol. 2, No. 2 JULY, 1930
Published by
STELLAR PUBLISHING CORPORATION
H. GERNSBACK, Pres. S. GERNSBACK, Treas. I. S. MANHEIMER, Sec'y.

Table of Contents—July

THE TIME VALVE
By Miles J. Breuer, M.D. 102
They were savages—these remnants of the human race in the year 200,000. Bound by superstition they were, until Wendelin came across time . . .

THE FLIGHT OF THE MERCURY
By Charles P. Tanner 106
All day on that hot Martian desert, they watched each other, man and mechanical beast. But then night fell . . .

THE BAT-MEN OF MARS
By Wood Jackson (concluded) 122
Across the gap in the wall swept the bat-men hordes. Above them hung the space ship, its guns trained . . .

AFTER 5000 YEARS
By Victor A. Endersby 136
Was this a dream come true after 5000 years, or a horrible coincidence . . .

THE WAR OF THE GREAT ANTS
By Jim Vanny 140
Above them could he heard the din, the struggle as the two great races of ants locked in combat. Who would win? Would it mean freedom or greater torture?

A SUBTERRANEAN ADVENTURE
By George Paul Bauer (Part 2) 150
They had watched the tortures of the condemned man. Now the jailers came for THEM. Sarro's face lit in triumph.

THE RED PLAGUE
By P. Schuyler Miller 170
Prize Story February 1930 Air Wonder Stories Cover Contest.

WHOSE FLIGHT WAS THE MORE HAZARDOUS?—Prize Letters 178

SCIENCE QUESTIONS AND ANSWERS 180

THE READER SPEAKS 181

SCIENCE NEWS 187

ON THE COVER

this month, taken from Charles P. Tanner's "Flight of the Mercury," our space traveler is shown waving his fist in defiance to the creature who has kept him marooned. Toward the rear of the space ship is seen the three "ether" propellers that carry the ship across space.

NEXT MONTH

THE ANNIHILATOR COMES, by Ed Earl Repp. Yielding to the demands of our readers our popular author gives us now a sequel of his "Beyond Gravity." In this thrilling story, we get the further adventures of the great airship "Annihilator," and its brave commander, Bob Allison. Into the frozen north they go, to search for the missing explorers; and they encounter adventures and a terrible menace that man had never dreamed of. Incidentally our author gives us a new view of the Arctic zones that is startling and revolutionary, yet has a good deal of authority for it.

THE MARTIAN REVENGE, by Hendrik Dahl Juve. You can always depend on this author to furnish an unusual story, and in this interplanetary adventure he has indeed fulfilled our expectations. He has shown us indeed the perils that attend communication with a strange civilization and in this story has illustrated vividly the horror that might attend the revenge of an outraged race. Indeed, through the stirring story, he shows us many of the things which must be avoided if interplanetary travel is to be a success.

THE TORPEDO TERROR, by Edsel Newton. It has already been acknowledged that it is possible to send an airplane into the air and guide it by radio controls without the need of a pilot. The immense importance of this in a war in the air cannot be overestimated. For by means of radio controls it will be possible for a nation to send thousands upon thousands of planes laden with high explosives over the enemy lines. But "The Torpedo Terror" is not a war story, in fact it is the working out of a great mystery and the saving of the world from a terrible disaster.

A SUBTERRANEAN ADVENTURE, by George Paul Bauer. The third installment of this marvelous story of subterranean life finds our two explorers from the surface again at grips with their captors. Stupendous are the scenes pictured by our author—as he shows two men, aided by a girl, engaged in battling against a hostile nation in their own land. This story with every page is approaching an inevitable climax of drama and power.

PRIZE CONTEST—The second prize winning story from the February, 1930, AIR WONDER STORIES COVER CONTEST will be published in the August issue.

AND OTHERS

WONDER STORIES—Monthly—Entered as second class matter in the Post Office at Mt. Morris, Ill., under act of March 3, 1879. Title registered U. S. Patent Office. Trademarks and copyrights by permission of Gernsback Publications, Inc., 98 Park Place, New York City, owner of all trademark rights. Copyright, 1930, by Gernsback Publications, Inc. Text and illustrations of this magazine are copyright and must not be reproduced without permission of the copyright owners.

WONDER STORIES is published on the 3rd of the preceding month. 12 numbers per year, subscription price is $2.50 a year in United States and its possessions. In Canada and foreign countries, $3.00 a year. Single copies 25c.

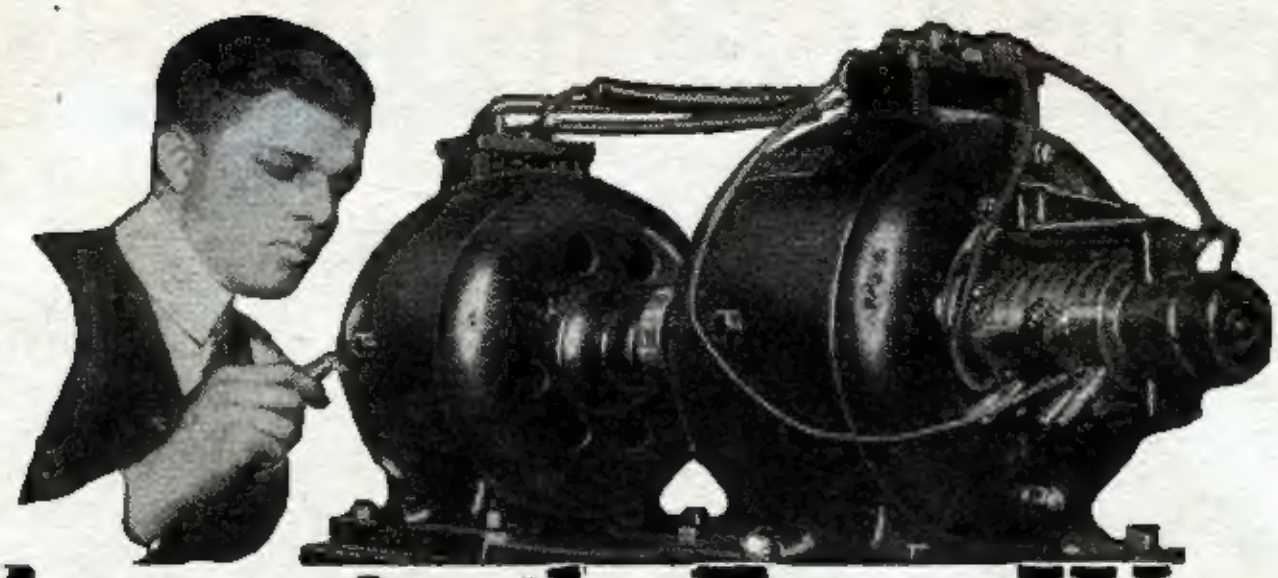
Address all contributions for publication to Editor, WONDER STORIES, 96-98 Park Place, New York. Publishers are not responsible for lost MSS. Contributions cannot be returned unless authors remit full postage.

WONDER STORIES is for sale at principal newsstands in the United States and Canada.

IF YOU WISH TO SUBSCRIBE to WONDER STORIES, make out all remittances to the Stellar Publishing Corp. Be sure to mention the name of magazine you wish to subscribe for, as we are also agents for the following magazines: RADIO-CRAFT and AMAZING DETECTIVE TALES, subscription price of which is the same as WONDER STORIES. Subscriptions can be made in combination with the above publications, at a reduced club rate. Ask for information. Subscriptions start with current issue. WHEN YOUR SUBSCRIPTION EXPIRES, we enclose a renewal blank in the last number. No subscription continued unless renewal remittance received.

CHANGE OF ADDRESS. Always give us old as well as new address and notify us as far in advance as possible.

STELLAR PUBLISHING CORPORATION
Publication Office, 404 North Wesley Avenue, Mt. Morris, Illinois. Editorial and General Offices, 96-98 Park Place, New York City.
Chicago Advertising Representative—L. F. McClure, 737 North Michigan Ave.
London Agent: Hachette & Cie., 16-17 King William St., Charing Cross, W.C. 2
Paris Agent: Hachette & Cie., 111 Rue Reaumur
Australian Agents: McGill's Agency, 179 Elizabeth St., Melbourne



Amazingly Easy Way to get into ELECTRICITY

Don't spend your life waiting for $5 raises in a dull, hopeless job. Now . . . and forever . . . say good-bye to 25 and 35 dollars a week. Let me show you how to qualify for jobs leading to salaries of $50, $60 and up, a week, in Electricity —NOT by correspondence, but by an amazing way to teach, RIGHT HERE IN THE GREAT COYNE SHOPS. You become a practical expert in 90 days! Getting into Electricity is far easier than you imagine!

Learn Without Lessons in 90 DAYS

By Actual Work—in the Great Shops of Coyne

Lack of experience—age, or advanced education bars no one. I don't care if you don't know an armature from an air brake—I don't expect you to! I don't care if you're 16 years old or 48—it makes no difference! Don't let lack of money stop you. Most of the men at Coyne have no more money than you have.

Railroad Fare Allowed

I will allow your railroad fare to Chicago, and if you should need part-time work I'll assist you to it. Then, in 12 brief weeks, in the great roaring shops of Coyne, I train you as you never dreamed you could be trained on a gigantic outlay of electrical apparatus . . . costing hundreds of thousands of dollars . . . real dynamos, engines, power plants, autos, switchboards, transmitting stations . . . everything from doorbells to farm power and lighting . . . full-sized . . . in full operation every day!

No Books-No Printed Lessons

No books, no baffling charts . . . all real actual work . . . right here in the great Coyne school . . . building real batteries . . . winding real armatures, operating real motors, dynamos and generators, wiring houses, etc., etc. That's a glimpse of how we make you a master practical electrician in 90 days, teaching you far more than the average ordinary electrician ever knows and fitting you to step into jobs leading to big pay immediately after graduation. Here, in this world-famous *Parent school*—and nowhere else in the world—can you get this training!

Prepare for Jobs Like These

Here are a few of hundreds of positions open to Coyne-trained men. Our free employment bureau gives you lifetime employment service.

Armature Expert, to $100 a Wk.
Substation Operator $60 a Week and up
Auto Electrician $110 a Week
Inventor . . . . . Unlimited
Maintenance Engineer up to $150 a Week
Service Station Owner up to $200 a Week
Radio Expert up to $100 a Week

Jobs-Pay-Future

Dont' worry about a job, Coyne training settles the job question for life. Demand for Coyne men often exceeds the supply. Our employment bureau gives you a lifetime service. Two weeks after graduation, Clyde F. Hart got a position as electrician for the Great Western Railroad at over $100 a week. That's not unusual. We can point to Coyne men making up to $600 a month. $60 a week is only the beginning of your opportunity. You can go into radio, battery, or automotive electrical business for yourself and make up to $15,000 a year.

GET THE FACTS

Coyne is your one great chance to get into electricity. Every obstacle is removed. This school is 30 years old—Coyne training is tested—proven beyond all doubt—endorsed by many large electrical concerns. You can find out everything absolutely free. Simply mail the coupon and let me send you the big, free Coyne book of 150 photographs . . . facts . . . jobs . . . salaries . . . opportunities. Tells you how many earn expenses while training and how we assist our graduates in the field. This does not obligate you. So act at once. Just mail coupon.

Now in Our New Home

This is our new, fireproof, modern home wherein is installed thousands of dollars' worth of the newest and most modern Electrical Equipment of all kinds. Every comfort and convenience has been arranged to make you happy and contented during your training.

Get This FREE Book

Mr. H. C. LEWIS, President
COYNE ELECTRICAL SCHOOL, Dept. BO-85
500 S. Paulina St., Chicago, Ill.

Dear Mr. Lewis:
Without obligation send me your big free catalog and all details of Railroad Fare to Chicago, Free Employment Service, Radio, Aviation Electricity, and Automotive Courses, and how I can "earn while learning."

Name.....

Address.....

City ..... *State*.....

COYNE ELECTRICAL SCHOOL

H. C. LEWIS, Pres. *Established 1899*

500 S. Paulina Street • Dept. BO-85 • Chicago, Illinois

NEW SCIENCE FICTION SERIES

THESE small books, illustrated by artist Paul, are printed on a good grade of paper. They contain brand new stories never published before in any magazine.

Each book (size 5x8 in.) contains one or two stories by a well-known scientific fiction author.

1—THE GIRL FROM MARS
By Jack Williamson and Miles J. Breuer

2—THE THOUGHT PROJECTOR
By David H. Keller, M.D.

3—AN ADVENTURE IN VENUS
By R. Michelmore

4—WHEN THE SUN WENT OUT
By Leslie Stone

5—THE BRAIN OF THE PLANET
By Lilith Lorraine

6—WHEN THE MOON FELL
By Charles H. Collatzky

7—THE MECHANICAL MAN
By Amelia Reynolds Long

The age of the robot is just dawning and some of its infinite possibilities, Miss Long dips into it in this thrilling story.

THE THOUGHT STEALER (Book 7)
By Frank Bourne

That it may be possible, sometime in the future, for a brilliant scientist to penetrate the minds of others and examine their thoughts, is the theme of this engrossing story.

8—THE TORCH OF RA
By Jack Bradley

All about us lies a tremendous amount of untouched power; in the sun, in the cosmic rays, etc. This power, if obtained and concentrated, might be put to great use.

9—THE VALLEY OF THE GREAT RAY
By Pansey E. Black

We know very little about the real potentialities of matter. There may be great civilizations that have found and utilized these potentialities far beyond our own conception.

10—THE ELIXIR
By H. W. Higginson

Brain power is often dependent on the influences of our glands. By proper stimulation of some kind, it may be possible in the future to produce great geniuses.

11—THE THOUGHT TRANSLATOR
By Merab Eberle

Mental telepathy is becoming generally accepted as an accomplished fact. Some of its uses, especially by mechanical means, may be very tragic or very amusing.

THE CREATION (Book 11)
By M. Milton Mitchell

It should be possible in the future to create living beings synthetically, and when this is done, there will be some amazing results.

12—THE LIFE VAPOR
By Clyde Farrar

Mr. Farrar is evidently an expert in his subject. He shows how, by proper control, it may be possible to change the entire course of human life.

THIRTY MILES DOWN (Book 12)
By D. D. Sharp

What lies far beneath the surface of the earth, still remains quite a mystery to us. Mr. Sharp has erected a rather amazing theory.

MAIL COUPON NOW

STELLAR PUBLISHING CORP.,
WS-7 93 Park Place, New York, N. Y.

Gentlemen:
I am enclosing herewith $..... for which please send me prepaid books which I have marked with an X:

☐ 1	☐ 4	☐ 7	☐ 10
☐ 2	☐ 5	☐ 8	☐ 11
☐ 3	☐ 6	☐ 9	☐ 12

Name .....

Address .....

City..... State.....

SPECIAL OFFER $1
All 12 Books for

YOUR CHOICE 50c
of Any 5 Books for

VOLUME 2
No. 2

WONDER Stories

JULY
1930

. . . . . Prophetic Fiction is the Mother of Scientific Fact . . . . .

HUGO GERNSBACK, *Editor-in-Chief*
DAVID LASSER, *Managing Editor* FRANK R. PAUL, *Art Director*
C. P. MASON, *Associate Editor*

ASSOCIATE SCIENCE EDITORS

ASTRONOMY

Professor Samuel G. Barton
Flower Observatory, University of Pennsylvania.

Dr. Clyde Fisher, Ph.D., LL.D.
Curator, The American Museum of Natural History.

Professor Willem J. Luyten, Ph.D.
Harvard College Observatory.

ASTROPHYSICS

Donald H. Menzel, Ph.D.
Lick Observatory, University of California.

AVIATION

Major William A. Bevan, B.S., M.S., M.E.
Air Corps Reserve, Professor Aeronautical Engineering, Iowa State College.

Professor Earl D. Hay, B.S., M.S., M.E.
Head Department Mechanical and Industrial Engineering and Professor of Aeronautics, University of Kansas.

Professor George J. Higgins, B.S. Aero. Eng.
Associate Professor Aeronautical Engineering, University of Detroit.

Professor Felix W. Pawlowski, M. & E.E., M.S.
Department of Aeronautical Engineering, University of Michigan.

Professor John E. Younger, B.S., M.S., Ph.D.
Dept. Mechanical Engineering, University of California.

BOTANY

Professor Elmer G. Campbell
Transylvania College.

Professor Margaret Clay Ferguson, Ph.D.
Wellesley College.

Professor C. E. Owens
Oregon Agricultural College.

CHEMISTRY

Professor Gerald Wendt
Dean, School of Chemistry and Physics, Pennsylvania State College.

ELECTRICITY

Professor F. E. Austin
Formerly of Dartmouth College.

ENTOMOLOGY

William M. Wheeler
Dean, Bussey Institution for Research in Applied Biology, Harvard University.

MATHEMATICS

Professor C. Irwin Palmer
Dean of Students, Armour Institute of Technology.

Professor James Byrnie Shaw
University of Illinois.

Professor Waldo A. Titsworth, S.M.
Alfred University.

MEDICINE

Dr. David H. Keller
Western State Hospital.

PHYSICS AND RADIO

Dr. Lee deForest, Ph.D., D.Sc.

PHYSICS

Professor A. L. Fitch
University of Maine.

PSYCHOLOGY

Dr. Marjorie E. Babcock
Acting Director, Psychological Clinic, University of Hawaii.

ZOOLOGY

Dr. Joseph G. Yoshioka
Illinois State Institute for Juvenile Research.

These nationally-known educators pass upon the scientific principles of all stories.

WONDERS OF THE UNKNOWN

By HUGO GERNSBACK

ALTHOUGH the past century has seen the publication of hundreds of thousands of volumes, crammed with facts gleaned by careful observers of every branch of science, and especially in the wonderfully-intricate field of biology, it may be said confidently, and without fear of contradiction, that the sum total of our exact knowledge of the universe is infinitesimal in comparison with the vastness of the phenomena about us. It is probable that the human race will never know one one-millionth part of all that there is to be known, even in our restricted portion of the universe. All around us we see evidences of activity too complicated for our comprehension; all that the limited human mind can do is to frame a few foolish questions, and dimiss the mysteries.

A few examples may illustrate this point more clearly:

Take, for instance, the migratory instinct of birds. Nothing is known as to what gives them this accurate sense of direction. Prof. J. Arthur Thomson states that some species of sea swallows, if transported from their nests in wooden cages and shipped to regions outside their normal migratory range, are in most cases able to find their way home in a few hours or a few days, according to the distance. The same is true of dogs, cats, ants and other living species which, even though transported in sealed containers, very often over great distances, are able upon release to find their way home. What mechanism of their brains enables them to do so, is not known.

One may take a female moth and put it into a small metal container, put this into another metal container handled by a different person, and so forth; until at last the moth is enclosed within half a dozen nested boxes. The last container may then be sterilized by various means until it would seem that no scent could possibly remain, or effluvium escape through the various containers. Yet a male moth of the same species will be unerringly attracted to the containers, beneath six layers of which the female is concealed. What sort of "wireless" or radio the moths use is another of the great enigmas of science.

Take, for instance, the common bat; if it is blindfolded and released in a room which is pitch-dark and criss-crossed with fine wires, it will not so much as touch a wire in its apparently aimless flutterings. Perhaps, one may say, the bat can see the wires in the dark. To disprove this theory, investigators have deliberately blinded bats, completely destroying their eyesight; yet, without sight, the bats still avoided the fine wires and threads as they flew about. Many explanations have been offered, as to this almost supernatural sense of the bats but none of the answers are satisfactory. We simply do not understand the evident facts.

A female wasp, of a certain species, will paralyze a caterpillar by stinging it in a certain nerve center; and then deposit her eggs in the still-living body of the caterpillar, which will be preserved in this condition to supply fresh food for the young wasps when they hatch. It is easy to say that this is a fundamental instinct for the preservation of life; but the wonder is, not only just how the wasp learned to do it, but how the knowledge has been transmitted through countless generations of wasps, none of whom have had any communication with their parents, through millions of centuries. Or else, though the entomologist may claim that insects do not reason, we will be forced to conclude that every wasp since the beginning of the species has reasoned out the details of this delicate procedure in the same way.

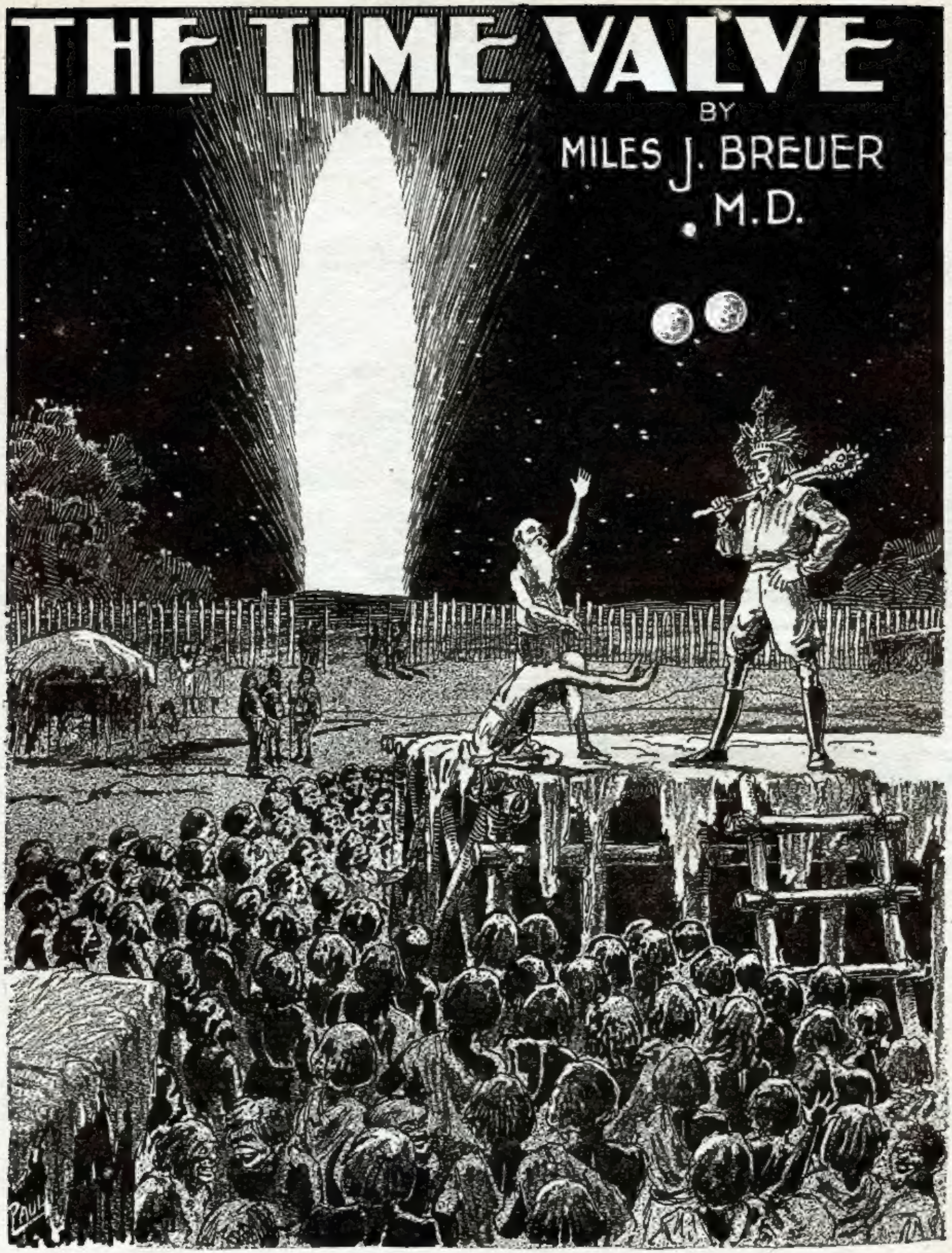
It would seem that we, ourselves, should know best what actions are going on in our own bodies, which are nearest to us; but we cannot comprehend the why of these processes, which are going on continuously, all the time, without our knowledge. One of the slightest, which follows a trifling occurrence like a scratch on one's hand, is a subject sufficiently complex, undoubtedly, to fill several libraries with the explanation. We do know that, the minute blood is drawn, the involuntary mechanism of the human body immediately sends into the breach small bodies, in the blood stream, to protect the injured spot and repair the damage. But, in so small a matter, there are involved hundreds of different activities, most of them quite unknown to us. Different kinds of living cells are transported to the "scene of the disaster," the escaped blood is caused to coagulate, and (by another process we do not understand) the further flow of blood is prevented. We understand nothing of many of these bodily activities; and it may be thousands of years before we fully understand even a few of them.

When it comes to other functions of the human body, a catalog which would be a tremendously large volume, our lack of knowledge is similarly appalling; though all these wonderful things are literally of vital interest to us, and concern our welfare more than any other branch of science.

THE TIME VALVE

BY

MILES J. BREUER M.D.



(Illustration by Paul)

Another double moon came; an election was held, Wendelin was put up on the platform and elected king.

A Sequel to the FitzGerald Contraction

FOREWORD

IT is now twenty years since the arrival and departure of the photon-ship. The events in connection with Wendelin's departure on a two hundred thousand-year honeymoon, once so vividly before the public mind, are now probably forgotten by all except some of the middle-aged and old people who were immediately concerned. Since it is my privilege to present the first connected account of the reappearance of Wendelin in the twentieth century, it will be necessary for me to give the briefest synopsis of the strange events that led to his abrupt and unexpected departure. My only excuses for this preliminary review are, that Wendelin's return to our own time will arouse intense public interest in the photon-ship and the little romance that caused it to vanish in a blinding glare; and the fact that *The FitzGerald Contraction,** in which I related the tale in all its particulars, has been twenty years out of print.

MILES J. BREUER, M.D.

Herman Wendelin was six feet three, and proportionately powerful; he looked slow and clumsy, but had a clever brain, and was a skilled aviator. At the time of which I speak, he was superintendent of the Cicero Landing Field in Chicago. He and I had been close chums and faithful friends since boyhood, and were at this time sharing a bachelor apartment, while I held a position as Instructor in Mathematical Physics at the University of Chicago.

Many strange ships landed on the broad acres of the Cicero Airport, but never one that compared with the huge polyhedron that appeared in a glare of blinding light, and contained thirty human beings. The coming of this vehicle had been watched through telescopes from near the moon. The inmates were human beings like us, and perfect specimens of mental and physical development. When they had first emerged from their ship, one of their girls, mistaking Wendelin for someone very dear to her, had run up to him and flung her arms about him. As soon as she saw her error, she retreated in confusion.

The visitors who had arrived from space learned to speak English with amazing speed, and within a couple of weeks one of their number, Addhu Puntreeahn, a powerful young engineer, was able to stand up before an audience of scientific men and explain their story in English to everyone's complete satisfaction.

He stated that they were racially related to us; in fact that we were their descendants. His race had once in the dim, remote past, lived on the continent of *Mu*, which had occupied the Pacific Ocean north and east of Australia, a fact which is being confirmed by scientific research of the present day. As the result of a huge cataclysm, the continent of *Mu* was torn off from the earth and flung out into space. It constitutes what is now the Moon. Its inhabitants foresaw the catastrophe, and prepared abodes deep down in solid rock, so that they might survive it.

The few survivors founded the civilization of the Moon. Within a thousand years, marvelous scientific and material progress had been made by them. The progress was partially stimulated by necessity, for the Moon's thin atmosphere was rapidly disappearing, and its none too abundant heat was being dissipated at a rate that caused grave alarm. The object of the Moon scientists was to develop vehicles that would carry their people back to the earth, where their telescopes showed them new continents, inhabited by races in the lowest stages of savagery.

Eventually a method of space travel was devised, by means of elements composed, not of electrons, but of photons or light-corpuscles. A new chemistry was developed, and it was found that these light-elements would float on a light-wave and be carried along at almost the speed of light. While the main group of scientists worked on the problem of transportation to the earth, an adventurous group decided to circumnavigate the Universe. They spent ten years in building a space-ship, and were prepared to live in the abundantly equipped vehicle to the end of their lives, to raise new generations, and thus to arrange for a remote future generation to return from the trip around the surface of the Cosmos. It was exactly analogous to Magellan's circumnavigation of the earth.

Just as the thirty-one people were ready to start on this trip, and the daughter of Drahnapa Dhorgouravhad, the learned old leader of the expedition, was about to

WE take great pleasure in presenting to our readers the long awaited sequel to Dr. Breuer's marvelous story "The FitzGerald Contraction." In this story which, truly, has all the elements of mystery, adventure and romance, we get a startling vision of what our earth may be like in the far distant future. Dr. Breuer does not pose as a pessimist when he shows us such a terrible picture of our human race 200,000 years hence. He tries instead to point out with scientific clarity that the human race is treading a dangerous path, that there are things that we must avoid if we are to keep our present civilization. And with it all, he has given us a thrilling story that cannot help but keep our readers breathless to the very end.

* *The FitzGerald Contraction* by Miles J. Breuer, M.D., January 1930 SCIENCE WONDER STORIES.

be married to one of the young engineers of the space-ship, this man fell fatally ill of a cosmic-ray burn. Her resolute disposition enabled her to make the heroic decision to leave him behind and start with the expedition, though she suffered intensely from it. It was this man who so closely resembled Wendelin. They entered the ship, started it, and within what seemed hardly more than a few hours, their automatic alarms, which were set to ring when the ship had re-entered the solar system, and which were not expected to sound for several generations, suddenly roused them with a determined clangor.

Thinking that something had gone wrong with the machinery, they looked around, and found that they were actually back in the solar system. But they saw the Moon cold and dead, and their civilization gone. They found the earth dotted with strange, new cities. Landing in one of them, Chicago, they made observations and calculated that they had been gone for two hundred thousand years.

Both their scientists and ours were able to answer the riddle. Their immense speed had caused a shortening of all their properties, length, time, etc., according to the Lorentz-FitzGerald formula, and two hundred thousand years had passed like a few minutes.

However, the *Mu* people became rapidly acclimated in Chicago, wore American clothes and rode American automobiles. Only six of them, three married couples, took slowly to our life. Wendelin and Vayill, the daughter of the old leader Dhorgouravhad, promptly fell in love. Suddenly, in the midst of a tremendous blaze of light, the photon-ship disappeared; a note left behind for me by Wendelin stated that he and Vayill had been married, and had started off in the space-ship on a honeymoon, accompanied by the other three couples.

CHAPTER I

Into the Future

I TRIED repeatedly to persuade Wendelin to write of his trip. But Wendelin cannot write; and if he could write, he would have refused to do it. He displayed the same attitude that was so noticeable among the soldiers who returned from the trenches after the recent World War; he refused to talk about his racking experiences. The best and most connected account he gave was on the sandy beach, just after we had rescued him from the savages. But upon his return, he shut up like a clam.

I was equally determined to get the story out of him, and I did get it, a word or a remark at a time. I carefully noted down every stray bit of information, but it was a couple of years before I had enough data to enable me to put the stuff together as a story. Consequently the story is in my own words. The reader must first picture this curious situation. Before all these strange events had occurred, Wendelin and I had been about of an age; we had roomed together, argued together on scientific matters, and played tennis together. We were evenly matched in our views and aims, because we were both young. But now, I am twelve years older than Wendelin. He is still a young fellow in his late twenties. I, who used to frolic with him, can see in him a reflection of myself as I was twelve years ago. To me the matter is clear, for mathematical theory is home-ground to me; but Wendelin has never been able to get it through his head. It still seems uncanny to him; he still has a scared light in his eyes when he looks at me.

Because of the time-shortening due to the Fitz-Gerald contraction, Wendelin traversed a period of two hundred thousand years into the future, without gaining in age more than a few minutes. It then required twelve years for us to devise a method of finding him and bringing him back again. During these twelve years the world kept growing old, and I along with it; but to Wendelin only a couple of months had passed.

He and Vayill are still a delightfully young couple. His favorite device is to begin singing her praises whenever I try to get him to talk about his two hundred thousand-year honeymoon. But every now and then a few words about some of the features of the trip would slip out, and I always pounced on them, without letting any change show in my face at my satisfaction in getting the information. Here is what I make out of his tale:

The trip itself was short. Vayill did not like the noisy, disorderly, hurly-burly rush of Chicago, and wanted to get away from it. They talked it over, got married, and decided to get into the space-ship and start it around the Universe again—just to get away. The other three couples, who were equally dissatisfied with our civilization, were delighted with the idea of going with them.

There was the same surprise at the short duration of the trip that there had been the first time. Hardly had the vehicle got under way, it seemed, when the alarms went off, and the lights went on, all over the ship; and their observations showed that they were back in the solar system.

"Didn't you *know* it would be that way?" I asked Wendelin; "it's just exactly like Addu described the first trip of the vessel. What did you really expect?"

"We hardly stopped to think about it; we just went." That was very much like Wendelin.

Their observatory showed them the earth, looking quite familiar and commonplace; and then the Moon. But, queer to relate, the Moon looked very small; and after some moments they discovered another moon. Obviously our satellite had broken into two fragments. They took their ship within the orbits of the two Moons and studied the earth a little more closely. Then they had to admit that there were a number of rather new features about the face of good old mother earth. The Atlantic Ocean was astonishingly wide, twice as wide as they had known it before, while the Americas were quite close to Asia. Florida was no longer a graceful peninsula, but a mere little wart. Australia was twice its familiar size, a big new piece of it extending to the north.

Upon approaching close enough to make out details, they were aghast to see, that while the continents looked pleasant and green, there were no cities! Not a trace of the huge, spreading splotches where should have been New York, Chicago, London, and the other vast collections of human structures. Not a city could they

find, though they cruised about and studied the earth's entire surface. We must keep in mind that they were looking for cities with large buildings and paved streets and a great deal of material construction work. They did note that America's mountain ranges had changed; that the Cordilleras were low, rounded, and green, while the Appalachians were terrifically high, steep, rocky, snow-covered. Evidently cataclysmic changes had occurred. Yet, the main general features seemed about the same.

It was natural that they should pick out as a landing-place the foot of Lake Michigan, at the former site of Chicago. There could be no mistaking the exact spot; Wendelin had studied the topography too often from airplanes. The Lakes looked just about as they always had; there was little if any change in their shapes. The travelers poised their machine above the spot where Chicago had once been. But there was no city there. There was sand, gleaming in the sun, a broad belt of it. Then, a mile from the water was a black forest.

The Savages

THEY got out of the ship and looked about. The trees in the near distance were conifers, and farther on were sunflower trees. Wendelin spoke of them as sunflower trees, and described them as real trees, tall and hard-wooded, with great composite flowers of yellow petals and black, disc-like centers. He mentioned several times the tight, gripping discomfort that came up within him as he looked across the sandy beach and saw nothing of the glorious city that had once been his home. They saw two amazing things before they were finally found by *the people*.

The first thing was the civilized insects. They looked like dark-brown bees, but were shiny, like ants. They had no wings. In fact it was chiefly their size that suggested that they might be bees; otherwise they were really ants. They had a tiny city, consisting of several thousand mud mounds grouped in hexagonal arrangements, with streets between them. On these streets were tiny vehicles dragged by beetles; and the bees or ants or whatever they were, carried little sticks and strings and other tiny objects. It was amazingly like looking into a child's story, where Bre'r Rabbit acts and talks like a man. But there they were on the sand, and the silk-clad scientists of *Mu* gazed at them with as much amazement as did Wendelin himself. They all felt an instinctive impulse to keep their hands off the ant city, and to avoid touching it so that they might not frighten or bother the insects.

Then the queer horses distracted their attention from the insects. A dozen or so of them came galloping down the sandy beach. Wendelin looked sheepish when he told me that these horses had trunks, like elephants; but immediately grew sober and insisted that it was true.

"Why not?" I asked; "it is certainly possible that such creatures may have evolved after two hundred thousand years."

The animals saw the group of people and stopped in their gallop toward the water, as though to investigate. They manifested quite an intelligent curiosity in the strange spectacle that the group of people must have presented to them, and gazed at them for a considerable while.

"It is not a horse; it is really an elephant," said one of the *Mu* men.

The animal had a broad, short, flat head and wide, floppy ears, just like an elephant's. Its proboscis tapered from six inches in diameter at the head, to less than two inches at the end, and was very active, always curling about here and there. I judged from Wendelin's description that the animal was really a true elephant which had evolved into this form for lightness and speed. He insisted that its body looked very much like that of a horse; and that at the distance at which they were, the illusion of a horse with a proboscis was perfect.

Suddenly the group of animals turned around and galloped back in the direction from which they had come.

There was now no doubt in the minds of Wendelin and his companions that they had traversed two hundred thousand years. Wendelin once tried to describe his sensations about it.

"It didn't seem real that so much time had passed. It seemed more like flipping the hands of a clock; and the queer plants and animals were more like some odd show."

Vayill, his wife, was fascinated by the gigantic sunflowers in great profusion all over the trees, and was anxious to get nearer to them. The entire group turned toward the forest of sunflower trees. Then the savages appeared.

"Savages!" I exclaimed, when Wendelin said it.

He couldn't think of anything else to call them. They were mounted on galloping horse-elephants, and there must have been twenty-five or thirty of them. They scattered themselves between Wendelin's group and the photon-ship, yelling and gesticulating. It occurred to Wendelin that the group of horse-elephants had at first seen them, and had gone out and brought this outfit back with them.

"My God!" Wendelin said, looking at Vayill. "Shut off here, two hundred thousand years from home! And this bunch of bloody savages between us and the photon-ship!"

"The photon-ship can't get you back home," one of the *Mu* men told him. "We shall never see Chicago again, any more than we shall ever again see Maj Halore, our city on the moon. Those thousands of years are gone, and can never come back."

The savages dismounted and rushed toward them. Wendelin was surprised at their appearance. They were short, not over five feet in height; they were practically naked, and copper colored, just like our original American Indians. They yelled and gesticulated and contorted themselves as they rushed toward our group of travelers.

"At first I thought they were talking English," Wendelin said; "it sounded just like it. I listened closely, but couldn't make out a word. It wasn't English at all."

Their hair was brown and was worn long, hanging to the shoulders. They were active, wiry, and lithe;

but their bodies were not well built and finely developed as had been those of the American Indians. They had round, fat bellies and projecting shoulder-blades and bow-legs. They were intensely ugly. They grimaced and cackled in a demoniac laughter, and gabbled their odd language. But they looked strong and active; and they looked intelligent. They were savages, but savages can be intelligent.

The City of the Savages

THEY closed around into a semicircle and finally a circle, surrounding Wendelin and his companions, flourishing spears and bows and arrows. They looked at the tall clothed men and women with unaffected interest, but they wasted no time and took no chances. Efficiently and swiftly they surrounded them and held them covered with their weapons. It reminded Wendelin of military strategy on the part of well-disciplined troops. All that he and his companions could do was to stand in silent dignity and await what would happen next. They held up their empty hands to show that they had no weapons.

"I could have kicked myself into the Lake for not having brought some pistols. We could have cleaned up the whole bunch of them," Wendelin said in disgust.

The savages searched them efficiently for weapons; Police-Sergeant Riley could not have done it any better. There was much talk that sounded like a gabbled English, but could not be understood. The savages seemed puzzled; they stared at our people and discussed them. But they were neither frightened nor awed. In fact, they seemed to hold Wendelin and the *Mu* people in a sort of contempt.

With rough shoves they indicated which way they were to walk, and took them along. They maintained good military formation, with a careful cordon about the prisoners, and the rest in front and behind in columns of fours. Even the order for "squads right!" had a very natural ring to it, although the words were strange. At this time Wendelin noted that the heads of the spears and arrows were of stone. One of the savages took charge of the entire herd of horse-elephants and conducted them away.

The march led away from the photon-ship.

Wendelin was depressed as they marched along. All his friends were dead and gone two hundred thousand years ago. How complete was their decay he could judge by the fact that even the steel and stone and concrete of Chicago were gone, and only low, round mounds of smooth sand remained in their place. There was no way of getting back to Chicago. This was all a silly thing to have done, just for a strange girl. Then one look at her, trudging along beside him, filled him full of pity for her because of the tragic fate into which their impulse had led them, and full of fury against the perverted looking savages. Heaven only knew what awaited them.

They marched only a short distance before they came to the city of the savages. It was quite a city! Of square houses it was, with slanting flat roofs; shabby, ugly shanties—unutterably dreary, thousands upon thousands of them. They were arranged in square blocks with straight streets between them, sandy streets filled with all imaginable filth. Horse-elephants roamed everywhere. The houses were made of logs that seemed to have been burned off instead of cut, of sticks and thatch and stones and mud; they looked thoroughly messy, Wendelin said.

They walked through a mile or so of dingy street, and entered a gate in a tall stockaded enclosure, in the middle of the city. Here they arrived just in time to see an odd ceremony. The stockade might have been a quarter of a mile square, and contained a good many shanties; but these were not regularly arranged as were those in the town itself, but haphazardly scattered. Here and there were trees and holes and piles of rubbish. People were filing into the guarded gate, and ranks of warriors among which mingled a few ugly women, were ranged in front of a raised platform at one side.

Four bald-headed, long-whiskered fellows in skin robes, whom Wendelin at once guessed to be priests, led a man up on the platform; and as they stood there in view of the audience, clay bowls were passed about, like collection-plates in church. Everyone dropped a twig into the bowl as it went past him. The bowls were brought up on the platform and the priests took out the twigs, one by one. The man between them was pushed off the platform, and slunk away; while another was put up in his place. He also was rejected by the popular vote and sent about his business, as appearances went; and a third, rather capable looking fellow, was "elected." The priests bowed to him, put a fantastic looking hat on his head, and handed him a terrific looking war-club, a gnarled chunk of oak with a knob at the end set with stone spikes. The populace cheered like a bunch of turkey-gobblers, and then the meeting broke up. They all bowed and grovelled to the new chief, and he led the procession out of the stockade.

CHAPTER II

Becoming Acquainted

THE ceremony as Wendelin described it, was to my mind a self-contradictory piece of horse-play. It appeared to be an election of some kind, conducted by methods which had a close resemblance to those used among civilized people. Yet these people certainly were not civilized. Up to this time, for instance, Wendelin had not yet seen a single bit of metal. By this time, in the progress of the story, I had made up my mind that these people were not savages in the ordinary sense as we understand it as evolving upward from a lower type. They were a degenerate race, come down from a higher, more civilized plane; they were savage to the core, but had perpetuated many of the outward forms of civilized practices.

Nearly all of the people went out of the stockade and the gates were closed—in a clumsy fashion by carrying logs across the opening. Spear-bearers conducted Wendelin and his companions to one of the shanties. The few other inmates of the stockade were savages, just as ugly as the rest of them. They lay about idly, and gobbled food when it was brought to them later

in the evening from the outside. Wendelin and Vayill found the food very repulsive, and eventually learned to eat the partly raw and partly scorched meat and bitter roots only because hunger forced them.

Without the loss of a moment the *Mu* men set about learning the language. They were treated gruffly by the savages whom they approached, but with true scientific meekness, they persisted. I might say that later on Wendelin also learned the language readily, and as he is no philologist, I judge that it must have been easy. Its resemblance to English impressed him strongly.

One of the *Mu* men who had some knowledge of astronomy, awaited the coming of night with considerable interest. When darkness came on, the stars were for a moment crowded out of their attention by a weird play of colored glows of light to the northwest. A mingling of pale colors played in the sky, in spreading, ray-shape from horizon to zenith, ranging from a violet color to the dull red of the neon tube of the commercial display sign. It had some resemblance to the *aurora borealis*, but was a pillar or a column instead of an aurora. Its width was an arc of about five degrees, and it spread like an inverted cone toward the top. Its lower portion was very bright and the colors mingled and changed rapidly there; toward the top it paled and dimmed. More than anything else, it looked like the glow out of the top of some enchanted furnace. They spent a couple of hours watching the wonderful spectacle before they turned their attention to the stars.

Wendelin knew the stars from the practical standpoint of an aviator, and was astonished to find that the pole-star no longer stood in the North. Its place was occupied by a bright blue star, which we have later checked up to be Vega. Between him and the *Mu* astronomer, some sketches were made; Wendelin has preserved two of them, showing the arrangement as they found it, of two familiar constellations, the Big Dipper and the Northern Crown.

The next day there was a trip to see the chief, made under rigid guard. The chief sat on a pile of skins in a shanty just as shabby as the rest, but hung with more skins. He was the same uncouth fellow with the glorious club who had been "elected" the day before. He stared and gabbled at them a while, and then ordered them back again. People did not treat the captives with much respect. They stared with rude interest and curiosity, and shoved them roughly about, and laughed hideously at these people who wore clothes and had clean faces. The savages acted as though our people were some new type of tame, harmless domestic animal for which they as yet had no use, prodding them with curiosity, shoving them out of the way, and turning their backs on them when their momentary curiosity had evaporated. I can picture Wendelin holding himself in restraint, with no signs of his impatience visible, but internally boiling with wrath and aching to get a good crack at one of them. But he would not fight without provocation.

The inmates of the stockade were not very friendly either; but for that matter, they were not very friendly with each other. There was a fight between two of them the following day, a snarling, treacherous melee which followed no rules, and in which teeth and blows and kicks and holds were all used. The rest of the savage inmates of the stockade gathered and watched it, howling with delight at the spectacle, until one of the contestants was left dead or unconscious on the ground. Wendelin never knew what became of him, but the incident left him worried.

However, they all managed to maintain relations sufficiently friendly to enable them to learn the language. Though the people treated them with contempt, like stray dogs, there was no actual cruelty. Before they learned enough of the language to get the status of affairs quite clear, an incident occurred to increase the savages' respect for Wendelin and his friends.

The God of Light

A GUARD with a stone-headed spear "tried to get funny with Vayill," as Wendelin put it; grimaced at her and caught her by the arm. Wendelin swung around and hit him a straight-arm punch on the point of the chin. It knocked the ugly little wretch six feet. Fifteen minutes passed before the man groaned and gradually got up and crawled dizzily away; in the meanwhile a crowd of savages watched him, glibbering with delight.

After that, the inmates of the stockade were immensely respectful to all of them. Crowds from without the stockade came in and stared with intense curiosity at Wendelin. In a few days some of them gathered courage enough to reach out and pluck at Wendelin. Shoving them away seemed to do no good; finally he kicked several of them roundly on the shins and sent them away howling, and this stopped their interest in him for the time being. The crowd seemed very much dissatisfied, and hooted and hissed. This curious performance continued for two or three days. Our people were patient with it because it gave them opportunity to study the language. Also, they could not help admiring the military effectiveness with which citizens were permitted to pass the gate and prisoners were barred. Eventually, one of the savages got the idea of plucking Vayill by the arm. Wendelin promptly knocked him sprawling.

Immediately the crowd began to yell and stamp with delight. That is what they had been after all of this time. It seemed to afford them the keenest pleasure to watch the unconscious man, to see him groan and turn over, and to stagger to his feet and slouch away. The next day another one sidled up to Vayill and grasped her shoulder. Wendelin was getting nervous; his fist fairly lifted the man off his feet. They did the same thing for several days in succession, until Wendelin recovered his sense of humor. He caught on to their game, and even noticed that the victim of his punch was thereafter an honored individual, so that they jostled for their turn to touch Vayill and get knocked down. He therefore kicked them on the shins and other opportune parts of their anatomy, until they got tired of the game. But no more were any of the party treated with the former contempt.

A considerable number of days passed, of which they lost count. They continued to marvel at the cone-

shaped pillar of changing colors at night, and at the changes in the stars, at the two queer little moons following each other about the sky. They discovered a tall tree from the top of which they could see over the city and out on the desert where the photon-ship stood. Day after day they longingly looked at its huge hexagonal bulk on the sand, so near and yet so far, and talked endlessly over plans for escape, which, no sooner proposed, were discarded as impossible. One day two of the *Mu* men were up in the tree watching, when a dull roar sounded and a deep vibration shook the ground. The observers reported that an explosion had torn a jagged hole in the side of the photon-ship. They attributed it to the explosion of tanks of liquid gases, oxygen, hydrogen, etc., which were stored in the vehicle for air, water, and fuel supplies. Obviously, the savages had been inside, playing with things, and had blown themselves up. For three days the photon-ship burned; and left behind a crumpled mass of blackened beams and plates. In spite of the fact that they had known all along that it could not lead them backwards through Time, Wendelin felt a vast depression at its destruction.

However, in the meantime they learned the savage language, and found out something about the situation in which they were. The people in the stockade were prisoners of war, members of other tribes captured in fights. War—it was a difficult conception for the *Mu* men—was the natural state of existence for these savages. It was their greatest pleasure, and they lived in it. They were always fighting, for any reason and for no reason. The prisoners took their fate philosophically; they weren't badly treated after the heat of the fight was over, though they were occasionally tortured. At times they were made to perform labor, and this they considered worse than torture. They were treated by the citizens with more respect than Wendelin's party had been, because they had been overcome in a jolly fight, whereas our people had given up without resistance.

The most astonishing thing about the business was the "election" of the king or chief, every time the two moons rose together. Apparently this was every month. At that time, the reigning chief was sent "to visit the God of Light." This was some sort of a euphemism; for, as a new chief was always elected, the conclusion is that the old chief never came back. In reply to questions about the God of Light, they stated that the god made men's hands fall off, and caused them to go blind, and ate off their noses. When asked if the God of Light was the same as the purple glow at night, they nodded violently in affirmation.

The warriors of the city voted for the new chief and all had an equal vote; but—here comes the perverted part of it—the chief was always from among the prisoners of war in the stockade. However, when "elected" he had absolute power, and lived in all the luxury they could give him. He could kill his subjects, have all the women he wanted, make war, or do anything except escape. It was an odd, inconsistent mess of customs. No savage race in the past ever did things like that. All these things were traces of degeneration from civilized customs and this idea was abundantly borne out by their physical characteristics, their pot-bellies, thin shanks, flat feet, and ugly faces.

A New King!

A DREARY, monotonous month passed. Wendelin himself learned the language. All of them exhausted their brains trying to devise some method for escape. They agreed that there was no hope of getting back to any civilized age or time; but they looked forward to escaping and establishing a little civilized colony of their own, from which in time a civilized race might arise and re-people the earth. A lot of inspired talk was expended among them on that subject, Wendelin said.

Then, so swiftly as to take away their breath, things happened; another double moon came, an election was held, Wendelin was put up on the platform and elected king. Before he realized it, he stood there with the ridiculous hat on, and the perfectly wonderful war club in his hands. For the moment he was terrifically undecided as to what to do, but resolved, in the absence of a better plan, to go on and play the game. What else was there left to do? At least his new position offered more chances of escape than did the situation heretofore. Had it not been for Vayill, he says, he would not have cared; he would have drunk the month to its fullest and accepted what its end had in store But one look at Vayill made him determine that within the month he must find some method of deliverance.

When he was conducted to the royal abode, the savages acted as though they considered it the height of luxury and splendor; their reverence was such that they held their breath and scarcely dared touch it. But Wendelin could hardly see the difference between one dirty shack and another; perhaps we have to make an allowance in our final opinion for his point of view as much as for theirs. Anyway there was a profusion of skins and pots and slaves, the latter such miserable, cringing creatures that Wendelin wondered why they cared to remain alive.

The savages took it for granted that he would want to take Vayill with him to the royal palace. But when the six other *Mu* people started along with him, the savages pushed them back. Whereupon Wendelin whirled around and roared at them—I've heard him do it on the aviation field—until they shrank back and let him do as he pleased. At a point further along on the march, several warriors bowed to Wendelin but held their spears in front of the *Mu* people to prevent their passing. Wendelin knocked one of them a dozen feet sidewise with the flat of his palm against the man's face. From then on the people all fawned upon him and let him have the *Mu* people with him. The *Mu* men were not to be despised physically; but they were still handicapped physically by the earth's greater gravitational pull.

Wendelin spent the month studying the city, becoming absorbed in his problems as a ruler, till the matter of escape really slipped his mind. Without watches and calendars, the time sped by with surprising rapidity. He felt that there ought to be some way of helping these people and doing good among them. There were so many things that needed to be done, and the

people were so helpless and so ignorant: they needed better houses against the rain and the cold; the streets needed cleaning; the methods of preparing and preserving food were terrible. The problem of sickness was a terrific one. Though he was no doctor he saw that there was much that he could do with the medical training he had received in his aviation work. The number of babies that were born and died under his observation was appalling. He kept seeing new problems, but could do very little. During the entire time he was there, he saw no metal anywhere.

The month slipped by rapidly. One night he was surprised by the onset of some sort of ceremonies. Hoarse drum-beating, shrill chanting, fires, suddenly roused the occupants of the royal palace.

"Tomorrow the King goes to the Lord of Light!" came the words of the chant from the swarming streets of the city. Vayill gasped and held on to Wendelin's arm; I could picture that because I've seen her do it. However, Wendelin was glad of the warning, and slept with his club, the head of which was studded with stone spikes. He had a plan in mind.

The next morning an amazing procession arrived at the royal palace, with drums and feathers and grease and paint and grotesque antics. Wendelin went with them down the street, at the head of the parade.

When the cavalcade went past the gate of the stockade, he turned in. They tried to stop him. He planted his foot down and roared at them. They were somewhat taken aback, but the whiskered priests, though puzzled at the unusualness of it, protested. The God of Light commands, they said. I am the God of Light, said Wendelin. The priests signalled to the warriors, and the warriors rushed at him. Wendelin swung his club and knocked over a dozen of the poor little fellows with spears, before they let him alone. He hated it. There they were, sprawled about with their heads battered flat and their limbs twisted up and everything gouted with blood. The smell of the blood made him sick. But he led the way into the stockade, commanding the priests to follow him. There, upon the raised platform, with the big club whistling round his head, he forced them to hold an election. One civilized man with a club forced the entire city to change a fixed custom. He wondered why someone did not shoot an arrow at him; but no one did. Wendelin was elected king for another month.

An Explanation

PROMPTLY thereupon, he decided to investigate the God of Light. He announced that he would visit the God privately. Would the priests go along and guide him? A few priests were willing to do so, and they set out mounted on horse-elephants. East to the Lake they rode, and then north. Within an hour there was no more vegetation. There was only bare sand and rocks and a smudgy, black deposit on the rocks that looked like the soot of a fire, but would not rub off.

Soon they were among low, rounded mounds of sand. There were long rows of these mounds, and aisles between them, intersecting each other at right angles. Here and there were larger mounds or empty spaces that interrupted the symmetry. Streets between mounds of sand! Eventually it struck Wendelin that he was on the site of Chicago. And only that evening did the full power of the realization strike him. Chicago! There was nothing left of it but low mounds of sand.

The little cavalcade stopped among the mounds and the priests would go no further. The God of Light would burn off their hands and feet and all their hair would fall out and they would go blind, they said. But they were willing to wait right here until night, and watch the beam of colors, from pale-violet to deep red, spreading upwards toward the zenith. At this distance there was a steady rumbling, roaring, rushing sound and a trembling of the earth, that kept up day and night.

Wendelin lay there that night, and solved the question in his mind. Thousands of years ago, Chicago had been destroyed by a radio-active bomb, which was still exploding. He had heard of continuous explosives; radioactive materials which, once set exploding, would continue to explode; and in ten thousand years would be only half destroyed; in the next ten thousand, half the remainder would be exploded, and so on. There must have been some terrific warfare in that part of Time which he had bridged. The wars had left behind only mounds of sand and savages, and a bomb that after thousands of years was still destroying itself.

The next month there was a repetition of the ceremony. They again attempted to lead him to some sacrifice in the radioactive volcano, and he had to smash the heads of a score of them and cripple up another score, before they elected him their chief for the third time. Then he attended to the wounds of those he had injured.

"That's another month to the good," he said to Vayill. "But I don't know how long I can keep it up."

He felt very blue and depressed about it.

From this point on, I can connect up the narrative from my own side.

CHAPTER III

A Ray of Hope

LET me begin my own story with the time when the photon-ship suddenly departed never to return, as a result of the caprice of the two lovers, Wendelin and Vayill. While the remaining twenty-three *Mu* men and women mourned the permanent loss of their companions, they seemed as a matter of fact less sorry than were the scientific men of the University of Chicago, who had expected some sensational findings in the contents of the photon-ship. I myself regretted tremendously the loss of the opportunity to probe into the scientific knowledge of a race that had advanced so much further than we.

There was one exception among the remaining *Mu* people, and this was the old man, Drahnapa Dhorgouravhad, the learned and venerable leader of the expedition. The departure of the ship containing his daughter made a broken man of him. These *Mu* people treated each other, on the other hand, with the outward evidence of a deep and tender love, and on the other hand a dignified and controlled reserve, which was especially

marked in the attitude of the members of the married couples toward each other. To see a man and wife of them together made me realize that human beings are capable of deeper, nobler, and more wonderful emotions than any we have ever experienced.

Yet, they took the loss of their friends quite philosophically. One of them, later on, was, outwardly at least, quite reasonably resigned when his wife died of the influenza, and went bravely about his business. But, old Dhorghouravhad's whole life was wrapped up in his brilliant daughter. He was crushed. He spent most of his time sitting and gazing dumbly into space.

The rest of the *Mu* people who had come with him in the photon-ship needed money to live on. The *Chicago Tribune's* subscription fund served them temporarily and as a start. Then they talked on the radio, gave lectures, wrote books on the things which they knew and for which the world was hungering, the ancient civilization of *Mu* and the civilization of the Moon now long dead and gone, and a great mass of scientific knowledge with which they were familiar and we were not. They all promptly got busy and traveled all over the world, all but Dhorgouravhad. He sat in silence and would not talk, except when directly addressed. The others grew independently wealthy, took an entire apartment house, and took care of their old leader.

I went to see him frequently; I felt bound to him by the tie of the common loss, for Wendelin had been my chum from boyhood days.

"Why do you take it so much to heart?" I asked him. "As far as you're concerned, she is dead; and you people take death philosophically."

"That is just the trouble. She is not dead, and will not be dead for two hundred thousand years. If I could know she is dead, I should be at peace. But she will be back here in two hundred thousand years. What will she find? What will happen to her? What sufferings and tortures are in store for he?"

The old man seemed as distressed as though he were actually witnessing the sufferings of his daughter.

"But by that time you will have been long dead and gone—"

"It seems as real to me as though it were right now," he said. "Twenty-three minutes. A little trip of tweny-three minutes is all that separates me from her, if—"

"Then let us make another photon-ship and go after her," I suggested.

He said no more just then. The idea must have made some sort of an impression on him. He must have spent many days in thought and study over it. The next time I came to visit him, the first thing he said was:

"There is an easier way than a photon-ship and a trip around the circumference of the Universe. I have been doing a great deal of thinking. It is quite possible to find out what kind of a world she will find here when she returns after two hundred thousand years. Our Moon scientists had done a great deal of work on the matter of looking forward into the future. Nothing clear and definite had been accomplished by my time, but the principles were well established. I never paid much attention to it. However, Addhu and I can work it out."

He had to wait until Addhu returned from a lecture trip in South America. But he waited patiently, saying that it made no difference; in a year from now the future would look just the same as if we did it today.

Dhorgouravhad did look into the future, and saw what the world would look like in two hundred thousand years, and confirmed the conditions about which Wendelin told. He did it by plain, straightforward scientific methods; there was no mystery, no hocus pocus about it. Dhorgouravhad and Addhu were scientists of marvelous ability; but their science was the same science as ours. It involved no new and unknown principles; it utilized the same physics and chemistry and mathematics as we use; only it had developed these to an amazingly further advanced stage.

Seeing the Future!

I HAVE the manuscript of a book to publish, giving the mathematics of this thing in detail, giving all the steps from algebra to the marvelous results they achieved, just as I learned it from Dhorgouravhad and Addhu. For, the problem was chiefly a problem of mathematics. When it came to experimental work, apparatus, and mechanics, I was at least as good as they were; in fact, I devised or supplied most of the mechanical portions of the method. It was the theory of it that was marvelously advanced beyond my capacity. However, under their instruction, I was able to comprehend it, and my book will soon make the details of it public.*

"The mathematics of it is simple," Dhorgouravhad told me. "It can be done in a couple of weeks," he said. "It's the gathering of the statistics that will be tedious."

"How long will it take?"

"Several years, if we organize a laboratory of several hundred technicians, and install the proper machinery for handling statistics."

"That will take money," I objected.

"We shall get the money."

Within a year he had the money. It was too late for him to go into lecturing and radio broadcasting; by this time all that he could tell the public had lost its novelty; and doing such things seemed trivial and distasteful to Dhorgouravhad. But he devised a cold light which cost two cents per thousand candle-power per

* Briefly, Dhorgouravhad's method was as follows: by means of the "graphic algebra" process of the *Mu* mathematics, the various variable factors in the progress of Time were expressed as algebraic equations. Each of these equations is given definite form by substituting known, past values; then by substituting any desired date in the future, the equation can be solved for the unknown variable. Finally, by the *Mu* mathematical process of "summary calculus" and infinite number of equations expressing individual variable-factors, were combined into a single equation, which expressed the progress of time, and which could be solved for any date, say two hundred thousand years ahead, and the value of any individual variable derived.

In order to work out Dhorgouravhad's plan in practice, it was essential to make a systematic survey of all the forces influencing changes in the world's affairs—truly a stupendous undertaking; but Dhorgouravhad was desperate, and also he had the ability to carry it out—the integrating all of the resulting equations into a single equation; and finally, in the terminal, integrated equation, substituting the abscissa value of 200,000 years and solving for the ordinate. The re-analysis of the resulting ordinate into component values is easier than the process of determining this ordinate, just as the differentiation is easier than integration.

year to operate, and a process for deriving electric current directly from coal. I don't know how many millions he had at the end of the year, but it was all he needed.

There was a fifteen-story building on the Midway, with two hundred and forty offices, each in charge of an expert in his line, for gathering data in sociology, geology, finance, genetics, sport, warfare, etc. Dhorgauravhad was training two hundred and fifty mathematicians to work with the statisticians. That buzzing fifteen-story hive of a building, with wires coming to it from all parts of the world, with laboratories for working out such statistics as were not already available —that was the "machine" for looking into the future. All for a slip of a daughter who was a little headstrong.

I have been too tedious already. For fear the reader will begin skipping, I shall summarize briefly what this machine said of the future period about which we are concerned. There has been so much sensational exaggeration in the newspapers about our five years of work, that I am disgusted with it. But, nevertheless, discounting for all the sensationalism of the newspapers, the "machine's" verdict is a gloomy, disheartening one. I have lost my faith in civilization, in the Universe, and in the "high things" to which my life was devoted.

A Gloomy Picture

THERE are two things which I must make clear before it is possible to understand properly the terrible fate which the equations predict for mankind. Several facts which came out of the calculation astonished us, although intelligent persons had seen them long before our calculations had ever been thought of. It is simple; there is nothing surprising about it. We all know it. The terrible thing is that scientific methods have made it seem so inexorably true.

One thing that was predicted was that the racial intelligence would decline over the next few hundred years, and leave us a race of lowered intelligence, highly emotional, improvident, lacking any ability to advance civilization or even to hold its own. That alone would down civilization.

The next result indicated the direction from which the active destruction would come. We know that even at the present time there are available enough explosives and destructive agencies so that a half dozen shallow-brained vandals could blow civilization off the face of the earth. It was evident that the future would bring more powerful explosives and more frightful destructive agencies.

It doesn't need any process of summary-integration to foretell what will happen with the decrease of average intelligence and the increase of destructive power. Only, the equations gave a fairly accurate idea when the catastrophe would occur. The equations allowed the present civilization about five hundred years. That certainly was a small fraction of two hundred thousand.

Beyond five hundred years we had a picture of mankind almost destroyed. The billions of people were gone. Only a few were left, at the level of brutes. Then there was a slow evolutionary climb—in thousands of years a little step forward; in many thousands of years, mankind had climbed up to the stability of savagery.

After the five years of gathering data were over, it took a lot of figuring to get this final result. Dhorgouravhad grew more pale and grim every day.

He rebelled against Fate. His giant brain would not permit this terrible thing to happen that seemed to be fated. Fate conquers mountains and races, but my friend from *Mu* would not submit to it.

"I can't leave her among a lot of perverted savages!" he said grimly.

"Let's build another photon-ship and go after her!" I said, thinking my idea was a bold one.

"I've thought about it," he sighed. "It would take ten years. I doubt if I shall live that long."

I had hoped that the future-solving machine would give the old man some sort of peace. Instead, it had driven him frantic.

CHAPTER IV

The Time Valve

DHORGOURAVHAD, the marvelous old scientist of *Mu*, became active again. He presented a fierce appearance in his fervor. In a few weeks he had given to the world his invention of the direct application and storage of solar power, and millions of dollars in royalties began pouring in again. Everyone remembers that time, how within a few months industry and transportation were revolutionized because power had become so cheap and efficient. Especially aviation leaped forward. The bullet plane is really a result of solar power; the advantages of the modern short, swift plane over the old type with wide wings and long fuselarge, are due to extra power more than to any other feature.

I had grown to love the old man. I sincerely pitied him for his fierce and futile love for his daughter. He was beginning to look piteously old, but was intensely occupied in his fifteen-story building with some sort of scientific work. I disliked very much to leave him, but I had been planning a trip to Europe for a long time, and had just received my leave from the University However, he assured me that he needed no help now, and would have something surprising to show me when I got back.

He did. The year and a half that I spent in English, French and German observatories means nothing in this story. But what he showed me when I got back, does. I looked him up at once on my return. He hustled me to the fifteen-story building which had once been the future predicting "machine." It was now a laboratory.

He led me feverishly to the back of the building and showed me a bullet plane of the type that has now become popular. It was of about the ten-passenger size, and was a marvelous thing, all made of glass. The stubby wings and the short body were all one glass shell. Inside of it, was a great deal of machinery visible; more than the usual solar-power plane contains. Outside, the only things that were not glass were the propeller and the rubber-tired landing-wheels.

I gazed dumbfounded.

"In that we shall travel two hundred thousand years!" he said dramatically.

I looked at him amazed. It sounded childish. It seemed for all the world like the things in the stories

of the science-fiction magazines written by writers who know insufficient science. Had the old man's mind begun to undergo senile degeneration? I could see no sense in the thing. Why make it of glass? How could he *fly two hundred thousand years?* I was genuinely grieved to think that the shock of the loss of his daughter had really unsettled Dhorgouravhad's mind.

I was due for a real surprise. He asked me to sit down with him at a table covered with blue-prints, facing the odd-looking glass plane. He talked to me.

"I've done it. I've found how to jump ahead in *time*, or backwards. I think I can easily make you understand it."

He beamed on me with a placid satisfaction that certainly had not been apparent in him when I had left for Europe.

"What I have done," he said, "is to construct a time valve which will allow us to escape into the future. The construction of the valve was not intrinsically different from making the valves for electrons that are used in radio transmission and reception. These latter valves permit electrons to go in one direction only. My entropy valve, which I call it, works just like an electron tube, my experimental models look just like the tubes used in radio."

"And that time valve as you call it will take us into the future."

"Precisely," the old scientist smiled. "It works on the principles of entropy, with which you are no doubt familiar. You see entropy is . . ."

And soon afterwards his explanation was over my head. And even today when I try to puzzle the thing out, it escapes me. It makes me feel a little humble for my race, too, to realize that this old man had a brain and a scientific knowledge that could cause our best scientists to feel like little schoolboys.

"So far, that is quite simple," he said on concluding his explanation of the valve. "It was a much bolder idea to make the whole tube in the form of an airplane."

"But why an airplane?" I said, somewhat groggy from his discourse.

"For use on arrival. It isn't altogether a safe bet to transport yourself through two hundred thousand years. We stand quite comfortably on this spot now. But in two hundred thousand years, you don't know whether there will be fire or water or solid rock or a hurricane or an explosion here. Suppose we made our time-trip in the usual helpless, immovable 'sphere' or box that you read about in science-fiction stories, and suppose on our arrival we found ourselves in the middle of a desert; or far out on the ocean; or on a battlefield between two armies, on foot, defenseless, without food, supplies, or transportation? The amount of good that we could do Vayill wouldn't be worth noticing. But, if we fly high up in the air and then jump across the desired time period, we shall be safe and in a strategic period."

"Then the fact that this machine is an airplane has nothing to do with the time-travel part of it?"

"Nothing. We could skip our time-period in a ball or a box or a bottle just as well. But I wanted a plane for safety, and as a convenient means of getting about in that future savage age."

I drew a breath of relief. It all began to look reasonable again. The old man's brain was functioning at its usual brilliant level.

"You see," he continued, "whatever system it is that is to rid itself of the illusion of time, or travel in time, must be between the elctrodes in the vacuum. So I have made the whole plane in the form of a vacuum tube. The electrodes are in the tips of the wings. The inner compartment can be sealed and filled with air to breathe. The solar power motor generates the power to operate the grid and the plate.

"With this we can go backwards and forwards in time. We can get rid of time. I have not studied any general aspects of the question; I have concentrated all my efforts on jumping exactly two hundred thousand years, minus eleven years, four months, and the odd days. I expect to get it accurate to within a few weeks; and we are equipped to spend that much time in searching and waiting around."

I sat silent and thought. I might see Wendelin. The affair with Wilma that I had mentioned in the account of *The FitzGerald Contraction* had turned out to be a transient one, for Wilma was now happily married to a doctor on the South Side. Dhorgouravhad looked at me expectantly.

"When do we start?" I asked.

After 20,000 Years!

WE sat in the inner compartment of the glass airplane. Both of us were breathing through the tube of the respiration-colorimeters which were to determine the current to send through the time valve Finally the old man put away our breathing tubes and moved a switch. The filament of the huge vacuum tube glowed beneath us.

"What now?" I asked.

"We shall rise twenty thousand feet into the air and then charge our electrodes. At that height we can depend on it that we shall be safe, in the period to which we are going, from running into a building or a fire."

The plane shot up in the abrupt spiral characteristic of the bullet plane, which I can never cease admiring Dhorgouravhad handled it well; but for that matter, these planes are so easy to handle that I can see the time when even "infants and invalids" as the malted milk advertisement says, will be handling them. Chicago melted together into a blot below us, and soon there was only gray mist down there.

"Now!" said Dhorgouravhad.

The only thing of which I was conscious was the extra hum of the generators, just as when an X-ray transformer is running and the current is switched into the tube. Anyone who has had X-ray pictures made of himself can picture vividly how it sounded and felt. Possibly there was an added thrill in the sensation that, unlike the usual patient under an X-ray machine, we were *inside* the tube. But, the little extra buzz of the generators was all that told us that anything had happened.

"Now we shall descend and see how it has worked," Dhorgouravhad said. "I've tried it a few times for experiment, and it has always been like this."

Below, was the very same mist. As we spiralled downward, Lake Michigan appeared, looking quite like

itself. But there was no dark blot where Chicago ought to be. Chicago was not there, where it had been a few seconds ago!

There was a bright white strip of sandy beach against the black water on one side and the dark forest on the other side. Down, down we went, and as we came within a few thousand feet of the ground, we did see a blot; a rather small blot—a dim, misty, empty looking blot. It might have been a hole in the ground, a crater of some sort, though its depths were not black. The middle of it had a sort of suggestion of luminosity about it.

Suddenly Dhorgouravhad acted very excited. He stiffened and jerked the controls; the plane wobbled sickeningly and shot abruptly upwards. His face was pale and sweaty as he looked at me. As the ground sunk away from us into the dim mist, he breathed in relief.

"Narrow escape!" he hissed between thin lips. "Some sort of an electrical disturbance; high-tension charges. I noticed the meters kicking, and it gained intensity like a flash. By the time I noticed it, it came near being too late. If it had wrecked the valve—"

"But!" I exclaimed, almost speechless in amazement, "the future machine stated that at this time the earth would be peopled only by savages. How can there be an electrical disturbance—in the absence of a storm?"

"I cannot answer it any more than you can," Dhorgouravhad said, shaking his head. "I cannot understand it. But we'll go down more cautiously this time."

Slowly we descended again, and as the needles fluttered, Dhorgouravhad turned the plane flat and headed southward. As he kept the plane on a level and flew southwards, the needles became quiet again. That is, it was not our distance from the ground that determined the electrical disturbance, but our distance from the queer blot on the site of Chicago. We were therefore confident that the electrical disturbance was due to the misty spot with the hazy center. We kept the machine in sight of the spot, but far enough away to keep the needles quiet.

Below us was bright sand. The afternoon sun threw shadows of little rounded hummocks that were arranged in straight rows, here and there interrupted by a larger hill or a flat space. There were miles and miles of the low dunes, symmetrically arranged in rows crossing each other at right angles.

"Chicago is a field of sand-heaps," Dhorgouravhad said mournfully. "Under the sand is probably steel and concrete."

It was a gloomy spectacle and a depressing thought, and kept me quiet for a while.

"But the queer hole? And the electrical disturbances?" I exclaimed.

Dhorgouravhad was silent.

"It acts as though it might be some radioactive disturbance," I suggested.

He nodded as though that were self-evident.

"But how can that be?" I exclaimed. It took a long time for the thing to dawn on me. "Such intense radioactivity breaking out on a cooled planet! The earth is too old for phenomena like that."

Dhorgouravhad looked at me sadly.

"Do you remember what I said about the living mind interfering with Nature. Man gets together great accumulations of energy. He gets up little wars and throws about radioactive bombs—"

"You mean—?"

"Civilization wrecked itself. What you see below is the crater made by a bomb of continuous explosive of radioactive material; the bomb that destroyed Chicago. Probably there is such a bomb on the site of every other large city."

It left me weak and speechless. After some minutes I managed to stammer:

"Detroit isn't far away. Let's look at it!"

The Meeting!

DHORGOURAVHAD turned the plane eastward We sped over dense forests and saw tiny moving things here and there on the ground. It seemed only a small number of minutes before the shape of Lake St. Clair appeared ahead of us. In ten more minutes we saw the misty crater and the jerking of the needles on our dials, and the innumerable mounds of sand arranged in rows with the shallow valleys of the streets between. Detroit was also a vast field of mounds, with that horrible, bottomless chasm in the center. We headed back toward the site of Chicago, unutterable despair gripping at my heart.

I could picture to myself that last war. There was a period of legal peace under a world covenant; the future-machine had told us that. But, with the continued lowering of the racial average of intelligence, individuals were no longer able to live up to it. Passions flamed up; some small group, say a city, worked up a grievance against someone in another place. Legal restraints proved inadequate for the old savage fire, with fast planes and stores of the terrible continuous-explosive so conveniently available. Possibly just a few individuals took it on themselves to sally out and perform the heroic feat of destroying their enemy city.

Then, someone from the destroyed city, or some friend of the destroyed city, was dissatisfied with legal means of dealing with the crime, and took retaliation into his own hands. Planes and bombs could be obtained. The offending city was the second one to be smashed. Thus the feud started. There could be no defense, no fighting of any kind, only retaliation for the destruction of one city by the smashing of another. With highly advanced explosives and highly advanced means of transporting them, it would not be long before there was not one stone in the world left standing on another, and men, such of them as were left, were without homes. So that is what our glorious civilization is headed for!

As we crossed the lower end of Lake Michigan again, the twilight was deepening, and we pushed the machine hard so that we might be able to land on the sandy beach while it was still light enough to see; we didn't want to smash the glass machine in the dark. However, as daylight receded, a strange purple glow ahead grew brighter and more brilliant. We saw that we need not worry about light enough to land by. The purple brilliance was sufficient.

As we curved down toward the shore, as near as

possible to what was once Chicago, we saw a winding procession of tiny figures moving across the sand; a long, thin string of them crawling along.

"People!" I exclaimed.

A few moments' observation showed us that they were moving across the violet-lighted waste of sand, directly toward the radioactive crater. We turned on our searchlights and slid down close, so that we might see them better. They were indeed people, almost naked, and dark hued. The figure of a huge man, head and shoulders above the rest, towered at the head of the procession.

Suddenly, as our searchlight picked them up, the line broke and ran, and the people scattered far and wide in all directions. And all of them scampered in the direction from which they had come, and away from the crater. The line was gone, and there were only scattered black dots disappearing in the distance. Then came the strangest spectacle of all.

There were four or five horses in the line, which were also thrown into a panic by the searchlight. They broke into a gallop, but went straight ahead, directly toward the changing blue and violet glow. Something queer in the shape of the horses made me follow them with my gaze; they formed little black profiles against the misty glow behind them. All of a sudden one of them seemed to burst into a bluish blaze. He continued running and the blaze spread over him and obscured him; and the blazing spot of him continued to run. Gradually it dimmed and went out, and there was nothing left behind, no horse, nothing. One after another the galloping horses burst into a blaze, kept on running until they were all consumed, and left us staring at the spectacle open-mouthed. Several blazing, galloping specks, and then nothing left.

But we had to look about us and land the plane, and when we did, we noticed that the fleeing men had left one of their number behind. He now stood alone, with our searchlights blazing on him as we taxied toward him. He hobbled slowly toward us, as though his feet were bound together. Gradually, as we sat there and stared, it dawned on my amazed intelligence that it was Wendelin!

I nearly smashed the machine getting out. I went toward him in big jumps, and then stopped within a few feet of him to look him over. There was something amazingly queer about him to my eyes. He, on his part, stood there with wide-open eyes at the glass plane.

"Some bus!" was his greeting, after a separation of two hundred thousand years. "Where'd you get it?"

That was the true, dyed-in-the-wool aviator for you He stood there with his hands tied behind his back and his feet hobbled together with a leather thong, obviously rescued by our opportune appearance from some sort of death and extinction; yet his first thought was to wonder at our plane. It required time for me to realize that this plane was far in advance of any he had ever seen; and at the same time in the back of my brain I was trying to solve what it was that was so strange about his appearance. In a moment I had it. He was young? Unconsciously I had expected to find him aged by the same amount that I was; but here he was, the same fresh, round-faced youth that he had been twelve years before. Then Dhorgouravhad spoke:

"And Vayill?" he asked.

Wendelin jumped.

"Cut these things!" he said.

The Attack

I CUT loose the leather strips with my pocket-knife. He flapped his hands from the wrists to relieve their stiffness.

"We've got to get her," he said, as if to himself rather than to us; then to Dhorgouravhad: "There's six more *Mu* people there."

"Where?"

"In their dirty town. Filthy, ragged, stinking dump. We've got to get her out. But how the hell it's going to be done, I don't see."

Anyway I was sure that it was Wendelin; his conversation sounded natural.

"Tell us about it," we urged in burning anxiety.

So, he told us the story; not as completely as I have given it, but sketchily and incoherently.

"They tied me up in my sleep," he concluded. "Taking me out to visit the God of Light. You saw what happened to the horse-elephants? They enjoy that sort of thing."

He was clear on one matter.

"The stockade is in the middle of the town," he said, "and there are thousands of the fierce little devils all around it. We can't get through them."

"Would it be possible to land inside the stockade and take off again?"

"No. There isn't fifty feet of clear space there; it's full of trees and holes and shanties. And every kind of rubbish."

We all stood puzzling and panicky.

"We've got to get Vayill out!" Wendelin said.

"We've got hand grenades," I suggested. "We could cut a way through the town from the beach." I was the same person who an hour before had been so horrified at the signs of destructive warfare all over the earth and so disgusted with man's fighting and destructive proclivities.

"Do you know the way through the town to the stockade?" asked Dhorgouravhad.

"Yes, but we couldn't slip through, not even in the dark. We are too big, and the little runts would spot us first crack."

Dhorgouravhad nodded. I could see that there was a plan forming in his head. We went back to the plane. The old man motioned to me. He handed me out two spare headlights and a sack full of automatic pistols. The headlights, run by solar storage batteries, gave a blinding glare in the night, and weighed about fifteen pounds apiece, including the batteries.

"Each of you hang one on his chest," he said to Wendelin and me. "Take a pistol in each hand and several spare ones in your pockets. With the lights and the pistols you can make your way to the stockade and back. You can frighten your way through the town when you cannot force it. If the lights do not settle them, a few shots will. Kill a few if necessary."

Suddenly Wendelin whispered: "Sh-h!" and snapped off the lights.

"Do you hear that cackling chant?" he breathed. "They never sing that except on a trip like the one they took me on."

We stood and looked.

"Quiet!" he whispered again. "They must be coming back."

Indeed, before long, the harsh, squawky singing became louder, and a dark column slowly emerged from the distance. We pushed our plane back out of their path, and lay down flat and watched. If they were indeed headed toward the crater of violet light, they would pass within a few feet of us.

I watched them with interest as they came on. Their precise march, quite military in character, contrasted oddly with the shrill, cackling effect of their song. I could hear Wendelin beside me panting in his efforts to restrain himself from leaping at them; for there indeed in the line were figures, hobbling along with tied feet, looming a foot taller than the rest. Which of them was Vayill, I could not tell, though I was confident that Wendelin knew. I could hear Dhorgouravhad whispering to him.

"He says wait till he gives the signal," Wendelin whispered to me. "Then jump up and yell and turn on your light and shoot up into the air."

Dhorgouravhad waited till the line was well past us. Then we all rose up—it must have been a terrific shock to the poor savages, the huge blazing eyes of dazzling light, the yells, and the shots. They broke and ran, in the only direction possible to them, for we had cut them off from behind, toward the pillar of violet light. Behind them they left seven shadowy and motionless forms standing on the sand. In a second, Wendelin had one of the figures in his arms, Dhorgouravhad was patting her head and murmuring something in the language of *Mu*. I was busy cutting thongs.

"And now quick!" Dhorgouravhad said. "It will take ten or fifteen minutes to measure the entropic rates of the new passengers. It's got to be done right, or we'll land back in the wrong period, which might be either inconvenient, or positively disastrous."

He led them into the car. I was last, and stood on guard outside the door, till he should finish the preliminary tests that were necessary before we could start. Though I had a pistol in each hand, I was worried stiff, what with the uncertain violet light, the queer shadows, the moving dots in the distance, and the fragile glass ship. Could an arrow damage it? A crack in the glass with its ensuing loss of vacuum, and here we would be, stuck in a degenerate world, with a roaring radioactive volcano near us, two hundred thousand years away from our home and kind. No sentry ever watched more keenly than I did then.

So, when several black forms showed up in the distance, trying to creep up on us, I potted at them with my guns without the least qualm. That they were human meant nothing to me just then. I was too tensely anxious about my own fate.

"All ready! Get in quick and seal the door!" came Dhorgouravhad's voice from within.

I jumped and obeyed, screwing the clamps down tightly. As I took my last look through the door, a tangled mass of black forms was charging at full speed toward us. But the drone of the propeller rose into a high-pitched whine, and the sand and the racing figures sank down from under me. It took me thirty seconds to get to a window; but the time I got there, the savages were fleeing for the third time, running madly toward the purple flames, away from our (apparently) pursuing ship. Even as I watched, two or three of the swiftly fleeing black spots broke out into a violet blaze, which trailed behind as they rushed onward. Those behind stopped in indecision, but in a moment were blazing too, racing madly in circles.

The first two or three rushing spots of flame went out, leaving nothing behind. My last fleeting glimpse as we rose up into the darkness, was a violet-lighted desert of sand, covered with racing, blazing spots. Thus did the curse of man's petty wars descend upon the remotest of his children's children, thousands of years later.

* * * * *

The ten of us in the cockpit held our breaths in tense anticipation. A moment ago there had been darkness below us, blackness and void. Then had come the crash of the switch and the rise in pitch of the transformer hum.

Now we thought we saw lights and glows below. Our heads throbbed with expectancy, as Dhorgouravhad sent the plane down toward the earth. Several glowing spots appeared down there, and rapidly spread beneath us to a sea of bright points of light, in long rows and dense clumps, and scattered at random. Wendelin was peering closely down.

"Ah!" he breathed. "The Hammond beacon! A slow red circle and a fast green one. A little more to the west."

Dhorgouravhad turned the ship to the west. Wendelin spoke again.

"Ah! The slow white circle! The Cicero landing field! Back home. Are you sure you can land her all right?"

His hands itched for the control stick, but Dhorgouravhad paid no attention to him; so Wendelin sank back in his seat and turned his attention to Vayill. She was pulling at his arm.

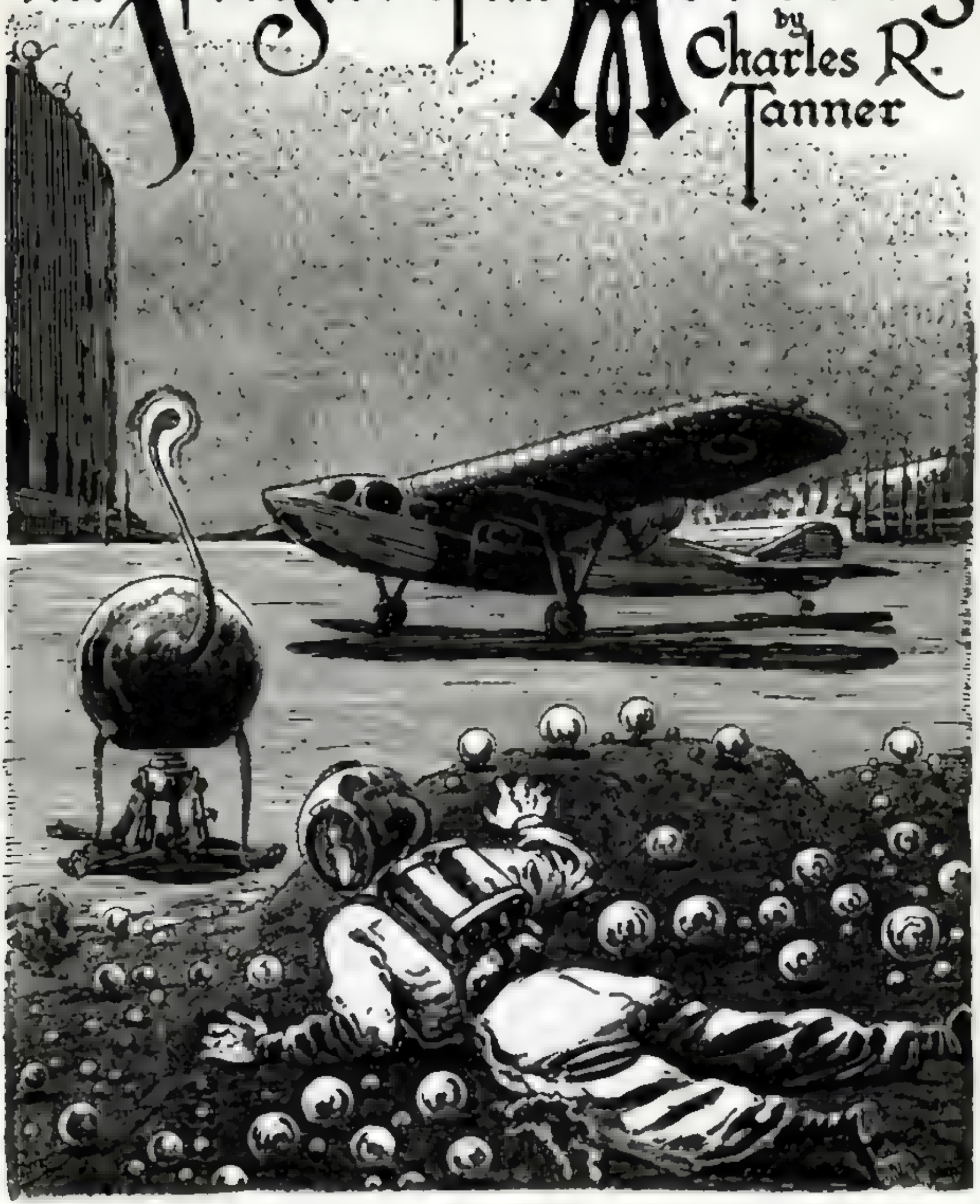
"This time," I heard her whisper meekly, "I am willing to live with you in that—what did you call it?—apartment."

THE END.

See the Summer WONDER STORIES QUARTERLY for the great story of the age
"ELECTROPOLIS"
by Otfrid von Hanstein **on all newsstands June 15th**

The Flight of the Mercury

by Charles R. Tanner



(Illustration by Paul)

Just then I saw *it*—a huge globe, mounted on stiff metal legs which gave clearly the impression of being mechanical. It sat down *and watched me.*

THE FLIGHT OF THE *MERCURY*

By the Winner of the SCIENCE WONDER STORIES *Cover Contest.*

I SAT at the entrance to my tent and gazed up at the sky. Like diamond dust, the Milky Way flung its misty haze across the zenith, and I speculated dreamily on the brilliance of the stars and planets in these tropical latitudes. It was a midnight in August, and above me Mars glowed like a large ruby; its yellowish-red light in strange contrast to the blues and whites of the stars about it. I gazed at it reflectively, as I had done a thousand times before, and then I jerked my pipe from my mouth with an ejaculation at surprise.

Across the darkness of the heavens, a darker object was speeding! An airplane, here in the desert, over a hundred miles from a civilized settlement! I watched it in amazement and my amazement only increased as I saw that it was rapidly approaching the ground. When I first saw it, it was little more than a spot in the heavens; yet as I continued to gaze, it drew nearer and nearer until I could make out all the details of its form.

It was a huge, tri-motored monoplane, and its entire body glistened like a polished copper. It moved with a speed that was remarkable, but as it drew nearer the ground, I could see that its speed was being reduced, and that it was maneuvering for a landing. All the time that I stood staring at it I was half-aware of something strange about it, but it was not until it was close to the ground that I realized that it was absolutely silent! That the engines were running seemed obvious from the accuracy with which the ship was manipulated; but although it was now no more than a quarter of a mile from me, I was still unable to hear the slightest sound from the propellers. I heard a thump as it struck the ground and, a moment later, I was hurrying off to see who and what the strange visitor was.

As I approached it, I began to see that there were more strange things about this machine than I had at first expected. For one thing, it was all metal, and the metal, which was either copper or copper-plated, glistened red in the light of the newly-risen moon. And for another, I saw as I came close that the three "propellers" were not propellers at all, but huge gray disks fully eight feet in diameter. They were three in number, and were situated at the rear of the plane instead of in front.

Pondering on the strangeness of the visitor, I had drawn nearer to it and was now beneath one of its huge wings. As I paused, the cabin door opened and a man emerged—a blue-eyed, light-haired man of about thirty-five, who looked as if he might have been a specimen from some museum case labeled "pure Nordic type." He was dressed in a dark wool bathing-suit, and, as he saw me in the light that emerged from the open door, he came forward eagerly, with extended hands.

"My word, what luck! A white man! You know, I never expected to run across a white man here in the Sahara! I do hope you speak English. My French and Spanish are terrible."

CHARLES R. TANNER

I hastened to assure him that I was acquainted with the English language and he grinned at my accent.

"American, what? I don't suppose it's necessary to tell you I'm British. My accent must be as obvious to you as yours is to me. What?"

I agreed with a smile and then invited him up to my tent.

"It's not often that I have a visitor in this neck of the woods," I said, "and I must admit I'm a little curious about that plane of yours. Is that some new kind of propeller you have there?"

"New kind of propeller? My word, yes! Wait till I get into some proper rags and I'll tell you something about it."

He disappeared into the plane again and I noticed with surprise that there were double walls to the cabin and that the door was operated on a valve system, there being an outer and an inner door, with a vestibule between. I stood there, puzzling over the strangeness of the vehicle until the stranger returned, this time clad in a sack suit that bore all the earmarks of having been recently cut by a London tailor.

"It's quite a neat little bus, eh? he beamed as he emerged from the car.

THIS story from the pen of the prize-winner of the November 1929 cover contest of SCIENCE WONDER STORIES *fulfills our good expectations for him.*

Mr. Tanner possesses an undeniable gift of portraying convincingly the strangeness and the atmosphere of the places that he writes of.

The present interplanetary story is really quite a simple one, and therefore is a relief from more involved stories But because of its simplicity it carries a directness and forcefulness that is hard to equal.

Mr. Tanner shows vividly some of the difficulties that an interplanetary traveler would meet on a strange planet, encountering a strange sort of life.

The Stranger's Story

I NODDED acquiescence and we strolled back to my tent. Arousing my servant, I bade him prepare a pot of tea (don't tell me I don't know my Englishman), and in a few moments we were seated at the tent door conversing like lifelong companions. I explained the purpose of my expedition into the desert, and discussed at some length the hopes I had of adding materially to the archeological

knowledge of the district.

"Jolly interesting," my visitor exclaimed, when at last I had finished, "but, my word! I've got a story that *is* a story!" and setting down his tea-cup (which he had emptied for the fourth time), he filled his pipe, lighted it and began to tell me his tale.

"My name is Harold Davies Fox-Kirton, and if that sort of thing interests you, I may as well admit that I have a title—Lord Dunsmere. But my friends call me 'Dirk,'" and he affectionately patted a short dagger that hung in a holder at his belt. I looked at it and then leaned forward with interest and surprise, for it was of Bedouin make and was thickly covered with jewels.

"Always wear it," smiled the Britisher. "Present from a silly old egg in Morocco, who thought I once saved his life. But that's another story, so that's that.

"But to continue— I've always been a sort of experimenter, and this bus is—well, what you might call my *magnum opus.** I've been working on it ever since directly after the war and there are at least a half dozen new ideas incorporated in it.

"But the greatest of all is my 'ether-propeller.' And it's such a simple idea, too. I can't understand why someone else hasn't invented it years ago!"

"Ether-propeller?" I asked, "You mean a propeller that drives through the ether?"

"Exactly, old man, that drives through the ether. Have you ever studied radio theory to any extent?"

I admitted a very slight knowledge of radio and he continued:

"Well, in that case, you are probably familiar with the wave analogy. You know, where they compare a broadcast note to a stone thrown in the water?"

"Of course," I answered. "The note or 'dot' in the transmitter sets up waves in the ether, just as a stone thrown in a pond sets up waves in the water."

"Righto. Or just as a hand clap sets up sound waves in the atmosphere," he continued, "That's it exactly. Well, I've just carried the analogy a little farther. Just as a screw drives a vessel through the water, or as a propeller drives a plane through the air, so this 'ether-propeller' of mine drives a car through the ether."

"By George! You have an idea, all right! How did you ever come to think of it?"

"Just to satisfy an old ambition of mine. Ever since I was a lad, I've longed to visit places that were never explored before. I knew, though, that there wasn't much left to explore on this planet, and I don't suppose I was more than fourteen years old before I was struck with the desire to visit the other ones.

"Of course, it seemed a hopeless ambition. But then along came radio, and the idea of communicating with Mars by wireless took up quite a bit of my time. I lived radio from the time I was seventeen until the outbreak of the War, and then all my work was swept aside and I found myself in Flanders.

"I don't suppose the War would have actually meant so much in my life if it hadn't been that I chose aviation as my branch of the service. But after the War (in which I bore a charmed life, and came out without a scratch), the idea of an ether-propeller came to me with a bang. I began to work it out at once, but it was ten years before I could get it finished.

"You see, my idea was something like this. I figured an aerial revolving somewhat on the order of an electric fan, with a 'shield' behind it to reflect the waves, like a beam. And I figured that the waves would have to be extremely short, approximating the X-rays in length, so that the atoms of matter would 'ride' on them as they passed. You understand, it was quite impossible to produce waves that short with the present type of transmitter, so my first job consisted of inventing something that would produce excessively short waves. I worked for seven years on that problem alone, and finally produced a radio-valve that was quite different from any ever made before. It incorporated features of both the radio-valve and the X-ray bulb, and it sent out waves that were only the minutest fraction of a millimeter in length.

An Astounding Statement

"I THOUGHT my troubles were over then, but, Great Scott, they were only just begun! I hooked up my transmitter to a revolving aerial, switched it on and—nothing happened. After studying the matter over, I at last decided that the speed of the aerial was too slow. So it was up to me to increase that speed somehow.

"Well, old chap, I won't go into all the details of my experimenting. When I finally completed my ether-propeller, it was built something like this. I took a very thin tapering piece of copper about four feet long and four inches wide. Then I prepared a liquid bakelite bath, and dipped the copper in it. When the copper was removed, a thin film of bakelite adhered to it, which, on drying, formed a very efficient insulator. Over this, a copper plating was formed, taking care that it should be deposited more heavily at the end where the copper was already thickest. This process was then repeated, and continued until there was built up a great semi-circle consisting of thousands of layers of alternate copper and bakelite insulator. Another of these semi-circles was now made and they were then fastened together to make a disk.

"And now I was able to bring into use the wisdom of another experimenter. Burton Farley, the great chemist, had succeeded, the year before, in discovering and isolating osmium B, an isotope of the element osmium, and had discovered in it a peculiar property. Normally a rather inert metal, when an electric current passed through it, it combined with the oxygen of the air to form an osmium oxide, a non-conductor. Of course, the electric current could not pass through the oxide, and so it ceased, and this, remarkably enough, caused the osmium to release the oxygen and revert to its original form.

"I utilized this peculiar element in the following fashion. Around the rim of my 'circle' I placed a band of osmium B of just the right thickness. Then around that I placed a band of copper. The current would pass from the transmitter to the copper band and, through the osmium to the first thin copper plate, which thus acted as the aerial. But as the osmium between the copper band and the first copper plate became oxidized,

* Master work.

it immediately stopped the current, which sought release through the second thin plate of copper. Here the same process occurred, driving the current to the third plate and so on around the circle.

"Now the osmium was carefully measured so that, just as the current completed the circle, the return of the osmium to its original state was begun. The result was that the current again found passage through the first plate and began the revolution all over again. Being entirely automatic, I secured a speed of over a hundred thousand revolutions a second! Neat, what?

"Well, on my first experiment with it, I used a wave-length that I figured was about that of an atom of copper. I held various elements before the circle, as I have called it, but felt only a tiny pull until I put up a piece of copper. My word! It took that bit of copper out of my hands like a shot! The propeller was lying on a table and it hurled the copper upward and buried it over an inch in the ceiling.

"So then it was merely a matter of time until I had built a nice little copper bus, named it the *Mercury*, after the old chap who used to fly between the heavens and the earth, and was all ready to strike out for Mars, Venus or any way-points!"

"By George! Do you really mean it?" I ejaculated, "Are you actually going to Mars in that car?"

"Going to Mars?" he answered, "Wait a bit, old chap. You don't understand. I'm just getting back!"

On to Mars!

FOR over a minute, I gazed at him in astonishment. Somehow, the idea that he was going to Mars was not nearly so hard to believe as that he had actually accomplished that incredible feat! For the first time since his story was begun I felt a doubt of the truth of his narrative.

He noticed my incredulity and laughed good-naturedly.

"I'll have you believing me before we say good-by," he grinned. "There are some mighty queer things in that car of mine, things that I feel sure will convince you or anybody."

Somehow, his careless matter-of-fact manner did more toward convincing me than anything that he might have offered in the way of proof, and I urged him to go on with his tale.

"Well," he continued, "when the *Mercury* was finished, you can imagine I lost no time preparing it for a trip into space. It was loaded with food and tubes of compressed oxygen, and I took along a lot of guns and ammunition, too. No telling what one may find on a trip to a world entirely different from ours, you know! And I had a rubber suit like a diver's, that had a metal headpiece connected to an oxygen tube, and this headpiece had windows of thick lead glass. That was for keeping out the ultra-violet rays of the sun, which would obviously be much more powerful on thin-atmosphered Mars than upon the Earth, quite sufficient to blind one if his eyes were exposed to their glare for any length of time.

"And oh! there were a lot of other things that I took along, but, don't you know—in the end I forgot to take any tea! You've no idea how refreshing these cups have been.

"So then at last I was ready, and one clear night I hopped off from my landing-field and headed for Mars. It was just like that, old chap, no mathematics, no careful aiming of my space-ship, none of the stuff that is so dull in most of the science stories one reads. You see, my ether-propeller enabled me to drive the *Mercury* just as easily as an ordinary plane, and so I just steered for my destination."

He paused for a moment, and puffed meditatively at his pipe.

"There's so little to tell about that flight," he said, after some moments of silence. "I rose up into the air, higher and higher, hour after hour, and it seemed that I was never going to cut loose from the Earth. My speed at first was about a hundred and fifty miles an hour, but it kept increasing, three miles a minute, five miles a minute, eight miles a minute, until at six o'clock it was approaching a mile a second. I almost said 'by dawn', but, you understand, there wasn't any dawn. Mars was almost in opposition,* and I was keeping my course as closely as possible directly toward her. So that kept me speeding westward, and held me in the Earth's shadow.

"My speed was accelerating all the time, even though there was the gravity of the Earth pulling in the opposite direction. You've no idea how uncomfortable a constant acceleration can be; but I held to it, for I was anxious to see just how fast my bus really could go. But I was doomed to be disappointed in this, for I never had the nerve to let it get above forty miles a second."

"Forty miles a second!" I cried, "but how could you avoid meteors and such particles of matter at that speed?"

"I suppose I did take a chance," was the answer, "but I rather imagine that that end of it has been a bit overdrawn by writers. At least, I never ran across any of those wanderers of space. If I had, there in the early part of my journey, it would have been the end, for I couldn't have steered the car away from it. You see, I was a damn' sick egg.

"I reached the speed of forty miles a second about the time I passed the moon's orbit. I decided that this speed was quite enough and ceased the acceleration. And then, my word! it was just like being in an elevator that suddenly began to drop swiftly. You know, that queer feeling that one gets in the pit of one's stomach? Well, it was just like that, only—it kept on! There was still enough gravity to keep me on the floor then, but by the time we reached five million miles from the Earth, almost the last traces of gravitational pull had vanished Of course there was a pull still there, but it was quite unnoticeable.

"It was about this time that I got my idea of constantly varying the speed of the machine, so that the acceleration would act as a substitute for the gravity. I would drop the speed lower and lower until I was going no more than a hundred miles an hour, and then pick it up until I was back at forty miles a second again.

"In this way, I constantly had an effect of gravity, even though I did have to spend half of my time walking about on the ceiling. And so my illness vanished. But

* The Earth was in a line between Mars and the sun.

I can assure you, old fellow, that the idea of space sickness has been quite under-estimated by the imaginative writers. It's something that has got to be allowed for.

Strange Life

"WELL, that's enough about the trip. It got to be the most boring, tiresome thing that I have ever lived through. It was only the promise of the wonders at the end of it that kept me going on. And at last one evening, I landed upon the surface of Mars."

He relapsed into another period of silence, and after a while again took up the thread of his story.

"Like most students of the planet Mars, I'd always suspected that the green tracts seen in the telescopes were vegetation, so I planned to land at the apex of that vast triangle known as the Syrtis Major, as the spot on Mars most likely to support comfortably both Martian life and Terrestrial, as represented by myself.

"It was dusk when I landed, and I was completely fagged from the work of the day. So without so much as a look out of the window I threw myself down on the cot and fell asleep.

"The next morning, you may be sure, I was up with the sun. As soon as I left the cot, I rushed to the window and gazed out at as unearthly a scene as might be imagined.

"I had landed on a low, rolling plain that stretched nearly a mile to a group of flat-topped, reddish cliffs in the distance. All the ground between me and the hills was covered with large groups of translucent, pale green globes that grew in scattered clusters over the ground and ranged in size from a few inches to as much as two feet in diameter. Here and there stood red, branching things not unlike cacti, their branches waving vaguely in the air as though searching for something. And far in the distance grew tall, tapering things, for all the world like a group of Lombardy poplars.

"Well, that was my first glimpse of the life of the planet Mars. I stood gazing at it in the light of the rising sun, and presently I began to wonder if this was animal life or vegetable. You see, those things breathed! You could see them expanding and contracting gently and regularly, the globes and the cactus-things; and it even seemed that there was some movement in the tall things in the distance. But there was no use in speculating, sitting here in the plane, so I hurried to make preparations to go outside.

"First I tested the temperature and the air. The temperature was all right, about six degrees above freezing, but the air! It exerted a pressure of only a little over six pounds to the square inch, and on analysis proved to have a far larger proportion of nitrogen than the earth. There was some oxygen, but not nearly enough to support human life. And there was hydrogen too, and carbon dioxide, in a ratio to the oxygen of about the same as we have on the Earth. In a word, except for the excess of nitrogen, there was about as much air as we would expect about nine miles above the surface of the Earth.

"So I unpacked my oxygen helmet and 'diving suit' and got into them, prepared to saunter forth. I realized now, how lucky I was in having those thick windows in the helmet. In this air, the ultra-violet light would have soon blinded me.

"Well, I stepped out of the car into a group of green globes, and then for the first time I thought about the gravity. Somehow, while I was in the car, it hadn't dawned on me that I was accepting the lesser gravity of Mars in a very matter-of-fact manner. I don't understand even yet why I didn't have trouble adapting myself, but I believe that the many days in space under a constantly changing acceleration had trained me unconsciously to accept any degree of gravity imposed upon me.

"At any rate, there I was walking along among the globes much the same as if I was on the Earth. The globes seemed to be semi-transparent, you could faintly see some outline of internal organs and veins or trachea. There was no doubt at all that they were complicated organisms. But as they were rooted in the ground, I decided that they were some sort of vegetable. After thinking it over on the way home, however, I don't believe now that they were either animal or vegetable, but something unique.

"And now I noticed another form of life. All about among the globes were little rods of a darker green, about the length of one of those cigars that you Americans called 'stogies.' For the most part they grew straight up in the air, but there were quite a number that lay flat on the ground, and one of these would occasionally give a sort of flip to its tail and shoot across the ground for about a foot. And twice I saw one reach a spot which it evidently considered favorable, whereupon it immediately buried its nose in the ground, stuck its bally tail into the air and became an immovable vegetable. I tried to pull one of these things up, but it seemed to be well rooted in the ground!

"Then my attention was attracted to one of the cactus-things that happened to be not far away. There were none of the other things within five or six feet of it, but as I looked, one of the little green cigars flipped itself across the vacant space surrounding it. Like a flash, one of the stiff-looking branches swept down and caught it, and, contracting, like the eye of a snail when you touch it, folded the thing inside the main trunk of the 'cactus.' Again I was forced to revise my estimate of the form of life these creatures were.

Hostility!

"I PICKED my way among the things, avoiding them as much as possible, for I didn't know what they might be capable of, and I've been stung once by a jelly-fish and have no desire to have it happen again. But the globes must have been harmless for I accidentally trod on several and although I didn't harm them much, they made no attempt to harm me.

"I made my way toward the tall things in the distance, for the rods, the globes and the 'cacti' were the only forms of life near me, and I was anxious to inspect everything in sight. But the clarity of the air was deceiving and the distance of the things must have been greater than I thought, for it was nearly noon before I finally reached them.

"And then their appearance was disappointing enough —just thin central rods they were, with tough, dark green plates radiating from them in all directions. But

my disappointment was not to be long-lived, for it was in this group of things that I found the greatest mystery that I was to see on Mars.

"Just as I entered the 'grove' I saw it—a huge globe nearly five feet in diameter, mounted on four stiff *metal* legs, a globe of just the same pale green color as the smaller ones, but one that gave clearly the impression of being artificial, mechanical. And as I drew near, it lowered itself on its legs, drew them up into it, and sat down on that squat, globular body and *watched* me! I hadn't a doubt, you know, from the beginning that this was a creature of some sort of intelligence, and that it was wondering what in the world I was."

He paused again, and after a moment went on, a reflective, philosophical tone in his voice.

"Have you ever thought how little we know about Nature's ways of producing thinking beings? We humans have hardly the faintest idea of the thinking processes of even the higher mammals. And when it comes to the birds and the insects, why, we're just at a loss where to start. Yet such insects as the bees or ants have evolved a very complicated social system without using, so far as we know, anything like what we call reason. Instinct governs them entirely, and yet they have a system of government superior in every way to that of us humans.

"But if we are at a loss to interpret the acts of these intelligent little insects, how are we to understand the creatures of another world? Back in the Proterozoic Age or the lower Cambrian, the ancestors of insects and men were probably brothers; but the creatures of Mars are totally unrelated to us. Yet, strange to say, there are some persons who expect to find familiar creatures, yes, even men, upon Mars.

"And so, in describing the events that followed, I want you to remember that I am as much at a loss to account for the actions of the creature as you. And I wouldn't be surprised, you know, if it were just as much at a loss to account for mine.

"When I first spied it, I just stood still and looked. Somehow, I wasn't surprised. There was no use in being surprised at anything one found there. So for a while I just stood still and looked—waiting, you know, for the Martian to start things. But the Martian evidently had the same idea as I; so after a little I began to make signs. I pointed to myself, and then to my plane, visible, off there across the plain; and then I motioned up into the sky in the general direction of the sun. The Martian made no response, so I began all over again, this time supplementing my gestures with a one-sided conversation. I knew, of course, that it couldn't understand, but I hoped that it would grasp that I was using some intelligent mode of expressing my thoughts, at least. The Martian never moved, however, and I began to feel no end silly, you know, swinging my arms around and chattering away there.

"But at last something did happen, although I haven't the least idea what it all meant. I've mentioned, I believe, that the Martian was of the same translucent shade as the globes that covered the ground. Well, after a while a brown spot began to form on a part of the thing nearest me. It got larger and larger and after a while a sort of streamer of mist or vapor emerged from it and stretched out toward me. As it approached, I started with surprise, for on the end of that streamer was a little round *solid* button, a brown glistening thing that came nearer and nearer and finally touched me.

"And then the Martian jumped as if it had been shocked, and the streamer of vapor snapped back into the brown spot which faded out far quicker than it had formed. And again we stood and stared at each other.

"After a while I had another idea. Surely the Martian would appreciate the intricacies of my plane. All that I could see of the creature was that globe and a faint glimpse of complicated machinery in the interior; but I figured from that, that it would surely comprehend some part of my machine; so I decided to go over and bring the *Mercury* back.

"And then something new and—well, sinister developed. As I turned to retrace my steps, the Martian glided around me and planted itself between me and my machine. I tried to walk around it, but it moved again, just keeping itself between me and the bus. I turned away, feeling a deuced queer sensation in the pit of my stomach, and pretended that I intended to walk in the opposite direction. It swept around me and planted itself in my path again, and quick as a flash I whirled and started to run in the direction of the plane.

"But quick as I was, the Martian was quicker, and in a moment it was ahead of me and had again placed itself directly in my path. And from then on, try as I might, I couldn't keep the thing from in front of me, whenever I tried to move.

Stalemate!

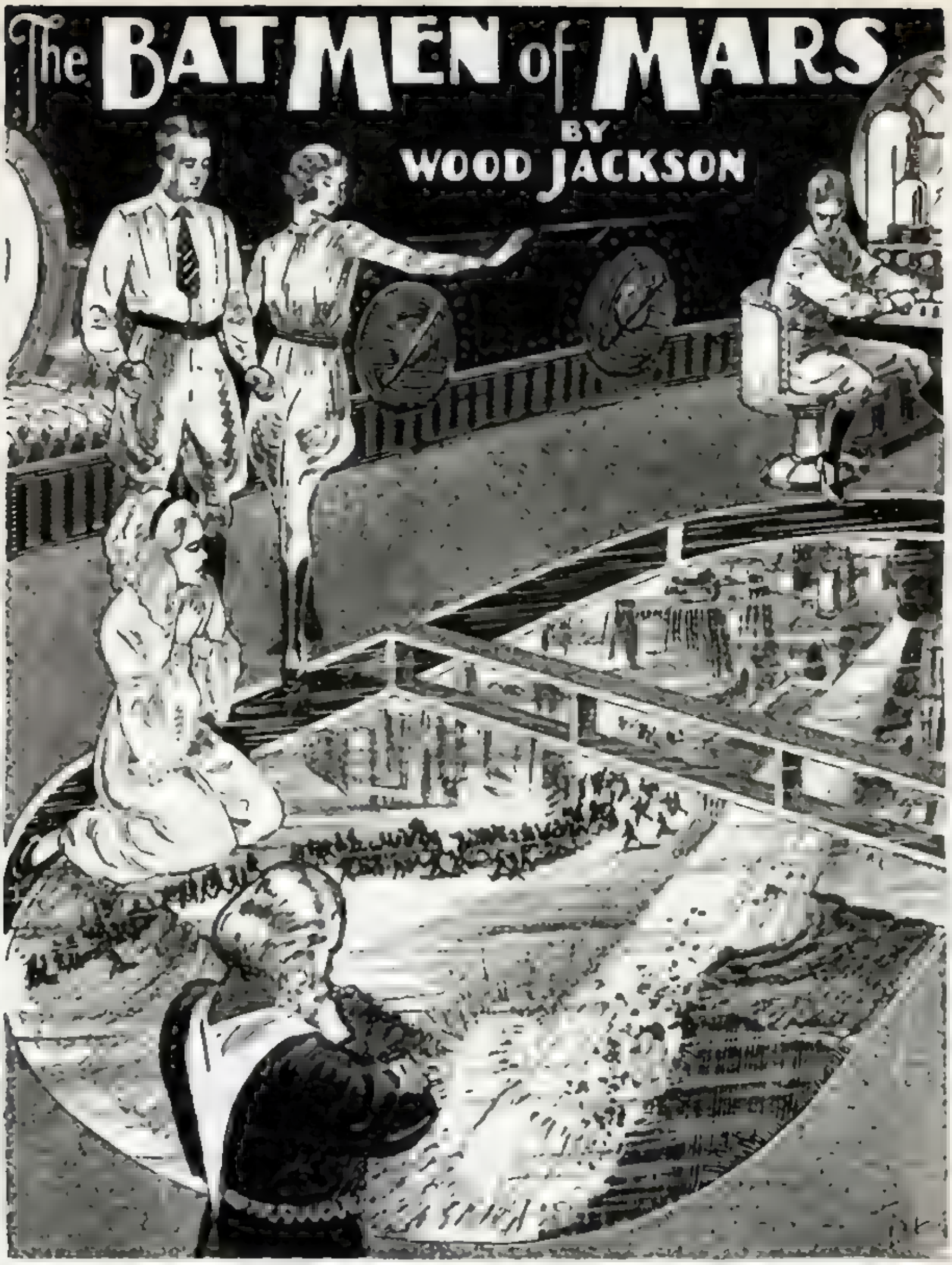
"I DID manage to gradually work my way nearer to my plane by a series of rushes in first one direction and then another, but as the afternoon grew later it began to appear that I could never reach the *Mercury* by nightfall. Although that may not seem so serious at first thought, just remember that the temperature of a Martian night must be far below zero. And I was hardly dressed to battle with a temperature of the polar regions.

"So I redoubled my efforts, but it soon became plain that sunset was going to find me quite a way from the plane, with the Martian still between it and me. And at last the sun did set, while I was still some three hundred yards from the bus.

"Have you ever run across the phrase, 'the night fell with tropical suddenness'? Well, the suddenness of nightfall in the tropics is a snail's pace compared to nightfall on Mars. So clear is the air that it remains almost broad day until the last tip of the sun has set. Then it's just like a black curtain sweeping up over the sky from west to east, and night is upon you.

"And with the coming of night, I discovered a new phenomenon of this world. Even before darkness entirely covered us, I could see that all the little globes that covered the ground were turning black. The cigar-shaped things were popping out of the ground, and as they fell on their sides, they, too, were turning black. And as the last faint rays of daylight fell upon the Martian, I saw that some subtle change had come over it, too. With renewed hope, and driven by the fear of

(*Continued on page* 179)


The BATMEN of MARS
BY
WOOD JACKSON

(Illustration by Paul)

Panic fell upon the Avinians as the blast of atomic power melted the ancient wall from their vision.

What Has Gone Before

Leonard Fry and Henry Randolph start off for Mars in a space-ship built by Fry. Fry is a young but prominent scientist while Randolph is a capitalist. While on the way Alicia, Fry's sweetheart, who has stolen onto the ship as a stowaway, reveals herself. They decide to allow her to continue with them.

They land on the surface of Mars and, as Alicia goes for a stroll, some strange winged creatures called Bat-men suddenly descend and carry her away. A horde of them attack the space-ship but the two explorers possessed of atomic disintegrators kill many of them and rise high into the air to avoid the others.

Alicia meanwhile has been taken to a cave by two Bat-men who begin quarreling over her. She takes this opportunity to escape and is picked up by a Martian air liner. They take her to a great city and she perceives that the Martians are highly developed people, human beings like herself.

By means of a map she indicates that she is from the earth and by pictures tells what has happened. The Martians allow her to try to communicate with the space ship by radio. She does this, establishes communication and tells her friends that a Martian ship is coming out to conduct them to the city.

When the space travelers come to the city, however, they are deprived of the ship and they see Alicia in a conveyance with a regal-looking man who turns out to be the Kor or King of Osin. They are prevented for some reason from going near her.

They are finally taken under the wing of Horo, the science high priest of Osin, the Martian nation they are in, and he tries to educate them in the language. He shows them a gigantic telescope in his observatory with a reflector a full thirty feet in diameter.

Horo finally explains why Alicia has been kept from them. There is a tradition on Mars that a virgin will come from another world and wed the Kor of Osin. When Alicia appeared, the Turinians accepted that as the fulfillment of the prophecy. The news of Alicia's arrival is kept secret, however, as Avin, the rival nation of Osin on Mars, has a similar tradition and since Alicia was found on neutral ground Avin might claim her. Avin learns of Alicia and demands that the Osinians give her up to them. Allowed the freedom of the city, our two earthlings are followed by a Martian who slips a note into their hands from Alicia, telling them to meet her at the palace. There, in a secret tryst, they meet also Tor Floro, the Kor's sister, who has befriended Alicia. Alicia is despondent when she feels there is no way for her to escape the impending marriage.

RANDOLPH had been silent until now. He had been enjoying the loveliness of Tor Floro, whose charm he sensed as she sat quietly near him.

"I wouldn't go that far, Alicia," he said, encouragingly. "There no chance at all that anything could be done tonight, but Leonard and I are now free for the first time to go about as we please. This is the first day the flying captains haven't been right at our heels whenever we have been away from Horo at the Por Lito. Give us a little time to think it over. You may depend upon it that if there is any way to rescue you we shall find it."

Alicia now told them of Tor Floro, and this was what Randolph had been most eager to hear.

"Tor Floro is in the same unhappy predicament I am suffering," said Alicia. "Her brother, the Kor, has commanded that she become the wife of Hanya, his chief adviser, and she both fears and hates him."

Instantly Randolph's interest in the situation quickened. Hanya! Daringly, he hoped that the chance he had been longing for to outwit the Kor's chief adviser was now to come. This, however, could not have been responsible for all his interest in Tor Floro. He noted the emotion of the beautiful Martian as her breast rose and fell at Alicia's words. And now, as she turned her eyes for a moment on him, he saw in them such an appeal as he had never seen in any human eyes before.

WOOD JACKSON

THE concluding installment of this marvelous interplanetary story is coming to an intensely dramatic finish! Overhanging our explorers is the superstition of the Martians regarding a strange prophecy. Between the two Martian nations there exists a determined rivalry for the virgin from the Earth. And separating these two nations lies the crater of Dir filled with thousands upon thousands of savage Bat-men ready to be released for the destruction of all humans. Surely here is a situation filled with many possible explosives.

There is no doubt but this is an adventure story par excellence. And yet between the lines we read a lesson. We see that many of the difficulties of interplanetary travel are not concerned with getting to another planet—but with existing on that new world. Our interplanetary voyagers must be equipped to meet thousands of unknown contingencies otherwise they will find a strange race or a strange environment ready to plunge them into oblivion.

"It was our mutual worry and anxiety and fear," Alicia continued, "that drew us together. Tor Floro wishes to help me escape from her brother, and I am eager to save her from Hanya. She has been a godsend to me. I know I should have lost my mind but for her sweet companionship and encouragement.

"Tor Floro, however, despite the fact that she is the Kor's own sister, is entirely without authority. She has no influence with which to protect me, nor can she even save herself against the designs of Hanya and her brother. Oh, please do *something* to help us! We are both in such trouble!"

"And what," inquired Randolph, as Fry sought to comfort Alicia, "would be Tor Floro's plans, her desire?"

"She wants to escape marriage with the despised Hanya."

"I understand, but how does she think that might be done?"

"Well, it's like this, Henry," explained Alicia. "She prefers death to marriage with Hanya, and of course a beautiful young girl like her does not wish to die. I have told her about our own world, and, while she loves Turinia, she would leave it forever if she had the opportunity. That is why we wanted you to come and talk things over with us. We both want to escape!"

Henry Randolph's pulse was beating faster now, and for a minute he could not speak. Swiftly

he thought of a daring possibility—Tor Floro aboard the projectile with him and his friends and going like a comet back to the Earth. Ah, but surely that were a dream! Yet, perhaps it might be accomplished!

"Would you really leave your own world, Tor Floro," he asked gently, "to escape from this unhappiness?"

The Martian girl's color mounted to her brow, but her graceful poise was unshaken. Then her answer came, her silvery voice thrilling Randolph anew.

"Yes," she said simply, "in life or in death, but I wish to live and find happiness."

"And are you very unhappy now?"

She turned her troubled eyes full upon him, and his question was answered. He saw the tears and the trembling of her red lips, whereupon he vowed to himself that she should have her chance if he could find the way.

"You would be willing to go with us to our world, to Sjor?" pursued Randolph. "You would trust us on such a venture?"

"I should be glad," murmured Tor Floro, smiling a little at the eagerness of his questions. "Something tells me," she added, "that I may find happiness anywhere if I only can escape from him—from Hanya."

"And that you shall do, Tor Floro," swore Randolph, "if the way can possibly be found. Cheer up, in the meantime, and we'll see what can be done."

Fry and Alicia had sat close togther, listening to them as they talked. But now all four seemed to realize that the time had gone swiftly. There was a gentle tapping at the door. Tor Floro turned out the light. The door opened and the Martian watchman appeared. He spoke in his own language. His knowledge of English was confined to the few words Alicia had taught him.

"I am soon to be relieved at the gate," he warned. "There is little time left." With that he was gone.

All four followed the watchman from the room and stepped out upon the gently sloping roof. Leonard and Alicia preceded the other two to the ladder down which the men were to go and leave the palace grounds.

Randolph and Tor Floro stood near them whispering in the night. And, although they had known each other for such a little while, the situation in which they found themselves was so unusual as to make possible developments that might otherwise require days.

"I am so deeply grateful to you for your interest," said the Martian girl.

Randolph marveled at her intelligence, for Tor Floro had spoken in faultless English which she had learned from Alicia.

"And I," declared Randolph, "shall feel it a privilege and an honor to serve you. Tor Floro," he said suddenly, "it might happen that I shall never see you again." He felt her shudder as her shoulder touched him. "On Sjor," he went on, "it is not the custom for a man to tell a woman immediately after they meet that he loves her. But the circumstances of our meeting are unusual, and I, Tor Floro, cannot go without telling you that I love you."

Tor Floro could not answer. But Randolph sensed her agitation. A moment more and they had joined the others who stood waiting. Randolph could see Alicia clasped in his friend's arms as they said good-by.

Randolph found Tor Floro's hand and lifted it to his lips.

"Farewell, dear maid of Turinia," he whispered, his lips so close to her ear that a strand of her brown hair touched his face.

"Farewell, dear friend from Sjor," she replied softly, "and we shall see each other again. I feel that fate will be that kind to us—to me," she added.

The two men descended the ladder, slipped to the gate in the darkness and were on their way to the Por Lito, the one searching his brain for a plan of escape from the planet, and the other dreaming of a queenly girl with soft brown hair and trusting eyes, who was willing to leave her own world in pursuit of life and happiness.

CHAPTER XIV

Horo's Great Fear

THE city of Hio was alive with rumors of what the Avinians had planned against Osin. The Earth-men found excitement a-plenty as they went forth the next morning after their clandestine meeting with Alicia and Tor Floro on the roof of the palace.

The Osinians were gathered in groups on the streets to discuss the new situation. Some had heard that Avin had declared war on Osin. There was a fear that Avin had secret weapons of great power and that Osin was doomed. Some scouted these stories as having been spread by Avinian spies in the service of their Kor to terrorize the capital city of Hio and frighten Osin into yielding up the Sjorian virgin.

But for all the excitement, the Osinians, so far as the Earth-men could determine, were of one mind on the issue itself, the demand of Avin for Alicia's surrender. Osin could be expected to stand firm and unyielding in support of the age-old prophecy. Had not Horo, master of sciences and high priest of Osin, and his predecessors for thousands of years kept the prophecy alive with promises of prosperity and happiness and power that should result from such a union with their Kor? Indeed, the Avinians could not reasonably hope to frighten Osin. The Osinian people would not yield and would support their Kor to the last.

Returning to the Por Lito, the Earth-men encountered Horo, who they could see, was anxious and worried.

"Another demand has been made by the Kor of Avin," he volunteered. "I have just come from the palace. Osin has been openly threatened. In fact, an ultimatum has been delivered by Avin. It is now demanded that the Sjorian maiden be escorted to neutral territory outside the walls of Dir by sunset tomorrow."

"And the Kor of Osin still refuses?" inquired Fry

"Naturally. Osin cannot, must not, and shall not yield the Sjorian virgin to the Avinians."

"And what was the threat, friend Horo?" asked Randolph, whose thought was also of Tor Floro.

"There was none beyond the impudent demand that Osin yield or take the consequences."

"But what, Horo," persisted Fry, "could the Avinians do?"

"I cannot say," faltered the master of sciences and high priest of Osin, "but I fear—oh, I fear—" The old man did not finish.

The Earth-men waited, hoping he would go on. They remembered he had done this before in discussing the same thing with them. But the troubled look in the old man's honest eyes deepened, and he seemed to age as he sat in silence, gazing out over the beautiful city from the proud elevation of the Por Lito.

"Just what is it you fear, my friend Horo?" urged Dr. Fry.

But Horo shook his head.

"I dare not express it," said the old man. "I wish I might refrain from thinking of it. The possibilities are so horrible, so unspeakable. Surely I must be wrong to attribute such perfidy to the Avinians, but the idea has haunted me constantly since the first demand was made upon us."

Neither Fry nor Randolph was disposed to discount Horo's great fear. They knew him better than to infer that his anxiety was due to the excitement of the populace. For they had realized that the venerable Martian was more than master of sciences and high priest of Osin. He was scholar, philosopher and statesman as well. Their contact with his mind and their knowledge of its powerful grasp convinced them that perhaps this one man alone knew what to expect.

"Have you warned the Kor?" asked Randolph.

"Oh, no. I don't wish to terrify him."

"Well, then, Horo, would it be war, possibly?" put in Dr. Fry.

"Of a kind, yes."

"You suspect they have weapons of which Osin knows nothing?" suggested Randolph.

"Not weapons, exactly," replied Horo, "but I know they have a great power for evil."

"A power for evil!" exclaimed Dr. Fry.

Horo bowed his head, the deepening lines of his face betraying his growing anxiety.

"Oh, you must mean a force in science," guessed Randolph.

"But I don't!" denied Horo. "If it came to science, Avin would be no match for Osin," he added proudly.

Strange Activity

As they talked, Ken Jari arrived. He was in his flying uniform, which showed signs of hard service in the air. He went at once to Horo, who looked up eagerly into the eyes of the handsome young Martian and awaited his report.

"There is no change along the frontier," said the flying captain, "but from a height I discovered great activity behind the Avinian wall. The people appeared greatly excited. It was most unusual."

"Did you encounter any of their flying captains?" inquired Horo.

"I saw two at a distance."

"Where were they?"

"Scouting over the craters of Dir."

"High or low?" demanded Horo, bending forward eagerly.

"They were flying low."

"And their course?"

"Directly along the walls of Dir."

"Did they continue? Was their flight rapid or slow? Did they halt at all?" Horo fairly flung these questions at Ken Jari in his excitement.

"They flew slowly," answered Ken Jari, "and they paused frequently as though intently studying something below them."

"Did they observe you?"

"Yes."

"And then?"

"They arose and returned at high speed toward their own country."

Horo sat silent for a full minute, gazing thoughtfully into the gray distances beyond the city. It was evident that he was reflecting, was searching for the hidden answer that lay somewhere in the answers Ken Jari had made to his questions.

The flying captain stood respectfully at attention. Meanwhile, the Earth-men were silent, both watching Horo and each busy with his own thoughts. They had followed Horo and Ken Jari as they talked and understood what had been said.

At last Horo looked up and gave Ken Jari instructions.

"Let every flying captain keep close watch upon Avin," he commanded. "We may expect action of some kind after tomorrow. You, Ken Jari," he outlined with great emphasis, "are to confine yourself wholly to observations in the region of Dir. Ken Mahu is to operate with you. Neither of you shall have any other duty. Keep an especially sharp lookout along the walls of Dir, and remember that by all means a watch is to be kept after nightfall. That is all. I shall inform the Kor and Hanya of the situation. You need not go to the palace. It is important that you leave Hio immediately."

After Ken Jari had gone, the Earth-men took their leave of Horo, and went to their own quarters. They suspected a message might come from Alicia at any moment, and wished to be available if a messenger sought them.

"Well, Randolph, what do you make of Horo's anxiety?" asked his friend. "I confess it has made an impression on me, and that I'm devilishly uncomfortable about it. Frankly, I don't like the looks of things."

"I'm sure the old fellow has sufficient grounds for worry," replied Randolph, "and I wish we knew what was in his mind."

"He seemed to consider Dir tremendously important," went on Dr. Fry, "as if the Avinians might make allies of the Bat-men."

Randolph whistled.

"I wonder if that was what he meant."

Dr. Fry laughed.

"Not literally, of course," he went on. "The Bat-men are mere brutes. The Avinians could not make allies of them."

"I understand that perfectly," returned Randolph, "but Horo, you remember, said the Avinians had an undeniable power for evil."

"But that it was not scientific."

"No, I feel that he would match them there, but I am puzzled to discover just what he could have meant. There's no doubt at all that he considers the situation very serious."

"And that's what worries me," said Dr. Fry. "It's

plain the old man is greatly alarmed. He is in fact downright scared and in dread of something he doesn't dare put into words. He even confesses he's afraid to think about it. And you know Horo is not the kind to go off half-cocked. He thinks things out to the end. My idea is that he is the only man in all Osin who has any idea of what the Avinians would attempt in an emergency."

"I admit it's beyond me," declared Randolph, "and I only hope that if this dread thing in Horo's mind develops we shall find a way to reach the girls."

"Are you in love with Tor Floro, Randolph?" asked his friend abruptly.

Randolph's face answered the question ahead of his voice.

"I want her, old fellow, more than I've ever wanted anything in all my life," he confessed.

"Then," declared Leonard Fry, "our interests are the same. Together let's work and pray for a way."

They waited far into the night, but no message came, and at length they retired, wondering to the last moment of waking consciousness what it could be that was weighing so heavily on Horo's mind.

CHAPTER XV

Tense Moments

THERE had been no further message from Alicia or Tor Floro. Nor had one come the next evening at sunset when the time limit set for the surrender of the Sjorian virgin to Avin expired.

The Earth-men passed the long hours in increasing anxiety. They went about the city of Hio, and everywhere they discovered that the main topic of discussion was the Avinian ultimatum and Osin's prompt defiance. Nowhere, however, did they find reflected such misgivings as Horo had confessed but had not revealed.

The Earth-men wondered at this, for, obviously, it could be interpreted in either of two ways. Apparently, Osin was not greatly worried. This might indicate ignorance of the true state of affairs, or it might suggest that Horo, himself, was mistaken after all.

The more they thought of it, the more mysterious it seemed. So at sunset when the Avinian ultimatum ended without Alicia's surrender, they were prepared to accept any development that came. They knew Horo so well now that it was difficult to consider him as a possible alarmist. In fact, the persistent refusal of the master of sciences and high priest of Osin to describe his fear in any way was proof enough that he was nothing of the kind. In the end, they agreed that Horo must have good reasons for the fear that obsessed him, and that the rest of Osin felt confident and secure only because of its ignorance of the possibilities

Yet, search as they might and did, neither could discover a clue to Horo's constant fear. War had been outlawed by the two peoples. There were no weapons in either country. Horo had made sure of that. So, they reasoned, there could be no war of any kind except an effort at hand to hand combat.

"But the Avinians are greatly outnumbered, Randolph," argued Dr. Fry. "They would have to bring such a conflict to Osin. And it would be foolish to suspect they would attempt that."

"Well, the old man is so sure of his ground that I can't help thinking he's right," rejoined Randolph. "It can't be that the Avinians have secret weapons with which to spring a surprise. If they had, Osin would know something of it. There is enough contact between them for that. It would be next to impossible for either to develop weapons without the other's knowledge.

"I can't escape the thought," Randolph went on, "that Horo's fear has some relation to the fact that Avin is surrounded and protected by that wall. Somehow it struck me when he first told us about it that the Avinians had an ulterior motive in undertaking such a task."

"I had the same idea, you may recall," insisted Dr. Fry. "I suggested, at the time, that Avin was protectd while Osin was exposed."

"And Horo didn't agree with us."

"No."

"And I believe I know now why he felt Osin was safe."

"And that was—?"

"He never really believed that the prophecy of a virgin coming from another world would come true."

"Well?" said Dr. Fry.

"So he felt sure that the two peoples would never find an issue between them that could lead to conflict. And now, while you and I know perfectly well that Alicia's coming here had nothing to do with the ridiculous prophecy, it is utterly impossible to convince Horo, or anyone else, to the contrary. And there you are! Horo's worry is due to the fact that Avin is secure at a time when something may happen, and that Osin is helpless."

"But what is that could happen?" protested the other. "That's what gets me."

"Of course it is!" agreed Randolph. "If we knew what could happen, we should know why Horo is besire himself with fear. But it's now sunset," he added, looking at the roseate glow as the orb touched the horizon, "and we may know something more tonight Horo, I believe, is expecting a demonstration at the earliest possible moment."

The Dreaded News

HORO dined with them in their quarters in the Por Lito. He was strangely silent, and seemed almost ill. It was plain that he was laboring under a heavy load.

Out of consideration for the old man, whom they both loved, neither referred to the question uppermost in the minds of all three. And after they had dined they went to the observatory at Dr. Fry's suggestion.

But tonight Horo was not interested in the heavens. While Fry mounted the platform and swung the great telescope into position, he paced the floor in quick nervous strides, his hands folded behind his back and a worried look in his eyes.

Randolph walked up and down with the old man, attempting conversation. But Horo was in no mood to talk, so his companion became silent.

Dr. Fry, meanwhile, was lost in contemplation of the wonders in the heavens as usual. The gigantic tele-

scope was a marvel to him. He never seemed to be able to get enough, and every night he spent hours at the eyepiece of the wonderful instrument, looking deeper into the universe than had any other man of his own world.

It was quiet in the observatory. The footfalls of Horo and Randolph made no noise as they paced up and down in their soft-soled shoes. The night was still and peaceful. Lights twinkled from many windows in Hio below the Por Lito.

Suddenly there resounded on the still night air a powerful report, as of an explosion. It seemed to be distant, yet it shook the tower of the Por Lito in which the telescope was housed.

Horo and Randolph stopped on the instant. The old man's face blanched and his form stiffened. Randolph saw horror on Horo's face and in his eyes.

"What was it, Horo?" he asked.

Dr. Fry came down to join Horo and Randolph.

The old man did not reply at once. He looked out into the night, far beyond the city of Hio that lay so peaceful and quiet and unsuspecting. Then he turned to his questioner.

"I can't say—yet," he replied, his voice trembling. "But I fear—I fear—the worst fate that could befall my beloved country and people."

"But what is that?" demanded Dr. Fry.

"By all means tell us now!" insisted Randolph. Both Earth-men were pressing him for an answer.

"No, no," refused Horo. "We must wait. It may be something else, and, besides, we may soon know. It shouldn't be long now if—if—" Again he broke off, to add: "Ken Jari ought to be here within the hour."

It was useless, the Earth-men knew, to press him further. And they agreed too, that the old man had a perfect right to withhold his fears from them, if he wished. He did not possess, after all, any more actual information than they had. He had kept them promptly informed of all the developments, and had closed the door only on what he feared and suspected the Avinians might be driven to do by their zeal for the Sjorian maiden's possession.

They remained in the observatory, waiting. Presently, Dr. Fry went again to the eye-piece of the great telescope. Randolph and Horo were now seated, but were silent. Randolph was glad to observe that Horo was getting better control of himself as they waited for news of what had happened.

Fry was lost at once in distant space in contemplation of the glories of the heavens. But he joined the others as Ken Jari, the handsome young flying captain, burst into the observatory with what they all sensed was an important report.

Horo was eager, but apparently was afraid to hear what Ken Jari had to say.

"I dread what he may tell us," he whispered to Randolph as the flying captain approached.

And then Ken Jari made his report to Horo, master of sciences and high priest of Osin. "Avinians, he said, "by using a powerful explosive, have torn out a great section in the wall surrounding the craters of Dir!"

The Earth-men fell back aghast at the words of the flying captain. Horo alone remained calm. His fears had already prepared him. But the Earth-men whitened on the instant.

"By heaven, Randolph!" cried Dr. Fry. *"That frees the Bat-men!* They are the weapons the accursed Avinians are to turn against the people of Osin! Was there ever a more hellish plot hatched by human beings?"

"But is there no way to hold the Bat-men back?" suggested Randolph turning to Horo.

The master of sciences and high priest of Osin sadly shook his head.

"We have absolutely nothing with which to meet the rush of the Taga horde that will follow," he told them. "Fire would stop them if they were but few, but they will come in swarms of thousands! They will venture forth at dawn tomorrow and will fall first upon the city of Tara which is near them. Oh, it will be horrible!" cried the old man in his anguish.

"I see now," Horo went on, "what an error we made when we left ourselves without defenses. But we have no weapons with which to repel attacks, and there is no wall about Osin to bar the beasts' approach. It means the end of Osin! The Taga will come and they will rend and tear. Oh, what a fate for my people!"

The old man shook as with ague while he lamented. He knew too late how far in hate the Avinians could go, for now there was nothing he could do to prevent them from wreaking their devilish vengeance upon Osin.

Randolph addressed Ken Jari, the flying captain.

"How much of the wall is destroyed?" he inquired.

"The explosion tore out a section of wall as large as the Por Lito."

"Could the break be held against the Bat-men by the flying captains?"

Ken Jari shook his head vigorously.

"We number only twenty, and by dawn there will be hundreds, thousands, of Taga a-wing and making for the open. It will be impossible to frighten them away from the breach in the wall, once they discover it."

"And it would take a long time to repair the break, of course," suggested Randolph.

"Ah, that couldn't be done at all, I fear," said Ken Jari. "The Taga couldn't be kept back long enough, and, besides, the Avinians would only tear out more sections. I'm sure they are bent upon Osin's destruction just as Horo, the master, has said."

The flying captain now left them and went at once to the palace to report to Hanya, chief adviser of the Kor. And then, alone with Horo, the Earth-men proposed a plan which they insisted could succeed in saving Osin from destruction and in giving the country absolute mastery over Avin. Horo's eyes brightened as Dr. Fry made his offer, seconded by his friend and ally, Henry Randolph.

CHAPTER XVI

A Plan to Save Osin

"HORO," began Dr. Fry, "I appreciate the fact of your great love for Osin, and I think I understand the despair that is now yours as you contemplate, in sadness and terror, its destruction. As you say, the Taga horde will fall upon your people and

destroy them. That is inevitable. Osin seems to be doomed. You have no weapons. You are utterly, pitiably helpless. Avin has a wall over which the Taga cannot go, so the Avinians are safe. Meanwhile, Osin, openly exposed to the horde, will be annihilated.

"Oh, Horo, you love Osin dearly! I know that. I have had the fact of your devotion demonstrated in innumerable ways since I have known you. You would save your country and your people, but you cannot! I don't wonder at the depth of your despair. But, my friend, all is not lost! It is not too late for this dread disaster to be averted. We know of a way to save Osin!"

Horo regarded the Earth-men with a new interest. He could not speak, for emotion, but a look of eagerness in his eyes urged Dr. Fry on.

"We really can save Osin, Horo," Fry assured him, "without the loss of a single Osinian life, if you will but let us do so!"

"You mean it?" asked Horo. "No, no," he cried in anguish, "it's impossible! Nothing can be done now, it's too late."

"But I *do* mean it," insisted Dr. Fry.

"It actually can be done, Horo," promised Randolph.

"But how?" demanded the master of sciences and high priest of Osin. "How can the terrible horde be held back from my beloved people?"

"We can do it easily, if you will let us have our projectile," said Dr. Fry.

"That could be arranged, surely," said Horo. "But in what way can the projectile perform such a miracle?"

Dr. Fry looked up to see Randolph shaking his head in warning. He smiled understandingly at his friend, having already realized that it was imprudent to let even Horo know the secret of the power that lay within the great shell.

"Is it necessary for us to explain, my friend Horo?" countered the scientist from Sjor. "Don't you trust us?"

Horo glanced up quickly and said with a force that compelled their attention: "I trust you, yes, but you don't tell me how you could do this. Obviously, you don't trust me."

"We could not," declared Randolph. "We have too much at stake."

"We dare not," agreed Dr. Fry, "for there are conditions, Horo, that must be met before we can reveal the secret of our power and its ability to save your country and people."

"And those conditions?" demanded Horo.

"The release of Alicia and of Tor Floro, the Kor's sister, and their freedom of action to accompany us on the projectile wherever we may wish to go."

Horo was astounded at Dr. Fry's proposal. "But that is impossible!" he cried. "The Sjorian virgin cannot be permitted to escape the destiny meant for her for thousands of years!"

"You are quite sure of that, Horo?" inquired Randolph.

"It cannot be otherwise," replied Horo. "But," turning to Dr. Fry, "I don't understand why you include the Kor's sister."

"Because I love her," said Randolph simply.

"That is not reason enough," declared the master of sciences and high priest of Osin. "She is pledged by the Kor himself to be the wife of Hanya."

"But she herself wishes to go with us," answered Randolph.

"How do you know that?"

"My friend Horo, I have seen her and talked with her. She hates Hanya, and would flee from him at any cost."

Horo was amazed. "When did you see her?"

"Two nights ago."

"And she would leave Turinia!"

"Even so."

Osin Must Be Saved!

THERE was silence, while the Earth-men waited for Horo to give them a definite answer. They believed he could be persuaded to agree to their plan, but they wished a way might be found to convince him before the Bat-men invaded Osin and claimed defenseless human beings as their prey.

For Horo, although interested in what they had said, was not yet convinced they could do what they claimed. He paced up and down in his study in the Por Lito, turning their proposal over in his mind. At last he stopped and confronted them.

"Won't you do this, my friends," he pleaded, "in the interest of humanity without imposing impossible conditions?"

"No, no, no!" said the Earth-men together, vigorously shaking their heads.

"Wouldn't you save Osin for its own sake alone?"

"But, friend Horo," reminded Dr. Fry, "Osin has not considered our happiness, mine and Alicia's, and now the happiness of my friend and Tor Floro, whom he loves, is also threatened."

"But think of the carnage when the Taga horde falls upon us! Think of a whole people wiped out of existence!"

"Ah, Horo," Randolph urged, "but *you* should think of that!"

Fry spoke. "Tender little children in the talons of the Bat-men! Beautiful girls carried off to their lairs in the craters of Dir! Old men and women torn limb from limb, a civilization wiped out and forgotten, a culture of the ages destroyed, the Por Lito a ruin . . . And all that, Horo," he went on, dramatically, "because of *you*, because *you* say it is impossible to give back to me the woman I love, the woman to whom I belong—a woman of my own world and kind, held prisoner in Osin against her will. Ah, Horo, I cannot understand you, whom I thought I understood and whom I believed I loved as my own father!"

The master of sciences and high priest of Osin whitened with fear at Fry's picture of the ruin that would come. But he remained silent.

"And in the city of Tara, the first one that the Taga will ravage, lives your own sister and her family. That promising boy, her son, Jao, who was a student here in the Por Lito and whom you had chosen to succeed you as master of sciences and high priest, is there even now. No doubt he and his mother are ignorant of the fate that is to befall them tomorrow. Horo, Horo!"

cried Fry passionately, *"you've got to do it!* By God, you yourself shall be the destroyer of Osin if you don't yield, for surely the Taga horde will come and destroy if you don't agree to our plan."

"But I don't know that you can do this thing," protested Horo. He was weakening.

"I shall be glad to give you the proof," said Dr. Fry.

"At once?"

"Of course. Can you arrange to have the guard dismissed, and then accompany us on the projectile?

"I have authority over the guard," said Horo. "I can dismiss them. And let us lose no time, my friends. Osin must be saved, whatever the cost!"

* * * * *

The guard retired at Horo's order and the three men boarded the projectile. Dr. Fry went at once to the controls. Nothing had been touched. The great steel shell was apparently in the same condition in which he had left it weeks before. A feeling of power came back to the scientist. He exulted, for he knew that the fortunate circumstance of the Bat-men's menace to Osin had given him precisely the opportunity for which he had longed. He would rescue a worthy people and at the same time protect his happiness and that of three others.

The great shell throbbed as the power was applied. The craft rose swiftly and easily to dart into the night at a speed far greater than the Martians had ever known to be possible.

Horo gave the course when asked to provide the scene of the demonstration.

"There is a ruin some miles distant," he explained on learning what was required. "It is the site of an ancient city, abandoned ages ago."

Within a few minutes, so great was the speed of the projectile, the ruin loomed up in the white glare of the powerful searchlight. It was a crumbling structure of massive stone. The Earth-men had seen it before, when in the air with the flying captains.

"And now, Horo," declared Dr. Fry as he brought the projectile to a halt in mid-air, "you will see what can be done in saving Osin from the Taga horde."

Horo covered his eyes as a burst of flame shot out from a lower deck of the projectile. Then he looked and saw the ruin crumbling into powder, grinding and crashing to the ground. In just a moment it was all over. There was no longer a ruin. It had been leveled, ground into powder. Atomic power, with which Horo, master of sciences and high priest of Osin, was unacquainted save in theory, had been released in all its potency.

"Are you satisfied, my friend Horo?" inquired Dr. Fry as they gazed at the dust cloud rising slowly from the ground where the ruin had stood. "Do you think that would keep the Taga horde back till the wall could be repaired? And do you doubt that Avin would beg for peace if this weapon were turned against her? Are you convinced that your beloved Osin can be saved?"

"It is marvelous!" exclaimed the old man, thrilled by the exploit. "You have won, my friends from Sjor. I shall do as you say. I shall deliver the virgin and Tor Floro into your hands this very night, and you shall hold the Taga horde within the walls of Dir!"

"And you, Horo," asked Dr. Fry, "will you suffer any penalty as a result of this night's work?"

"That won't matter," said Horo. "The Kor will be furious, of course, but I am an old man and I don't care what happens to me. I shall feel to the end that I have done my duty by my country and my people."

"But, Leonard," suggested Randolph, "Horo should be in no danger at all. Can't you see that we shall have the Kor of Osin at our mercy, too? And Hanya as well? We can compel them to agree that Horo shall remain unharmed. And all Osin, I am sure, would demand that, once the populace knew how he had saved it from destruction."

"Why, of course!" agreed Dr. Fry. And on the way back to Hio, Horo, although not worried by what might happen to him, consented to accompany them on the projectile's expedition to the broken wall of Dir.

Before returning to Hio, however, the plan was worked out in detail for the rescue of Alicia and Tor Floro. Without lights, the projectile would land quietly on the grounds of the Por Lito, and Horo would leave it there, to go direct to the palace of the Kor. Then he would accompany Alicia and Tor Floro to the roof where the meeting had been held two nights before.

Meanwhile, the projectile would ascend again and hover over the palace until a signal was given by turning on a light in the room on the palace roof. Horo and the two girls would then enter the projectile, which would proceed at once to the walls of Dir and there hold the horde of Bat-men at bay till workmen could repair the breach.

"I shall leave a message for Ken Jari," decided Horo, "who will come to us at dawn. We can send him to Tara for a large force of workmen. Ah, my friends," he added, embracing them, "you have made an old man happy this night, and if you succeed, as I know you must, all Osin will bless your memory for untold ages."

Then, the projectile gently landing, Horo stepped forth into the night and was gone.

CHAPTER XVII

To the Attack!

HORO succeeded in escorting Alicia and Tor Floro to the roof of the palace without attracting attention. Neither the Kor nor Hanya had seen him. Nor did anyone question his right in the palace, for, as master of sciences and high priest of Osin, he was privileged to come and go as he pleased.

The moment he told the girls of the Earth-men's plan, they enthusiastically accepted it. Eagerly they went with him to the cupola-like room on the room.

Tor Floro herself flashed the light which had been agreed upon as a signal for the projectile to descend. She was quite willing to leave Turinia and cast in her lot with these friends from another world, since this meant her escape from the despised Hanya.

Besides, Tor Floro's heart told her that she might find happiness on this new and strange adventure. Randolph had attracted her more than she had confessed even to herself. So the sister of the Kor of Osin, young and proud and beautiful, cast the die with willing hand

because it meant freedom and perhaps a happiness on Sjor that her own world could not offer.

The projectile settled gently in response to the signal till it almost touched the roof of the palace. Horo and the girls entered the great shell, whereupon it ascended silently till, gaining height, it took course for the craters of Dir where it had work to do at dawn.

It was past midnight when the projectile left Hio. En route it passed over Tara, which might have been a doomed city but for the fact that Horo loved Osin too well not to dare the wrath of the Kor in circumventing him. Tara lay peaceful and quiet beneath the adventurers, blissfully ignorant that the protecting wall between it and the Taga horde had been broken.

Dawn came early. They had not long to wait. Horo had said the Taga horde would be astir in the early hours of morning.

No one on the projectile had thought of retiring. The girls were too excited over their escape from the palace for that, and, besides, they were about to participate in the most thrilling exploit ever known on the planet of Turania.

Dr. Fry stilled the projectile near the break in the wall and waited. The shell was kept at a height the Bat-men could not reach, and there it hung as the gray dawn appeared beyond the craters of Dir.

The breach made by the Avinian explosives was extensive. Apparently, there was only one such breach, as Ken Jari had reported. It was guessed that Avin had been content with this one effort at Osin's destruction.

"The breach in the wall is very long," observed Horo to Dr. Fry. "Can you command it sufficiently?" He was still a little nervous about the possibility of this miraculous weapon from Sjor.

"Easily, friend Horo," replied Dr. Fry. "We could spray the Bat-men with the burning death if the breach were many times as large. You see we are the center, and the rays radiate from the projectile in any part of a circle that we decree. They are effective for several hundred yards. There is not a thing to worry about. The Bat-men can't leave the crater so long as we guard Osin against them."

"But if the Avinians create new breaches in the wall, what then?" asked the old man.

"I doubt that they will, yet I have thought of that complication which may develop. I think we ought to send a flying captain to Avin to warn the Kor against further demonstrations. However, Horo, if more breaks appear in the wall, we can still save Osin. The projectile is swift. We could overtake the Bat-men and kill them instantly before they could do any damage."

Randolph and the girls were busy with powerful glasses, searching the craters for the first sign of the Bat-men. Alicia saw a movement along the tier of grottoes and reported it. In a few minutes, as the darkness lifted still more, they could see many black, ungainly shapes moving into the open a short distance away.

"The Avinian devils!" exclaimed Randolph. "They plotted to some purpose and tore out the wall close to the grottoes in order that the beasts might discover the opening without delay."

"That would be like them," agreed Horo. "They counted, of course, on our complete destruction."

Then the Bat-men came, some afoot in their shambling, ape-like gait, and others on the wing, flapping heavily.

"Is everything ready, Leonard?" asked Randolph, who had machine guns unlimbered for use in case of emergency.

Dr. Fry nodded, watching the Taga horde gathering.

"Napoleon, himself, could not emerge through the opening with the projectile here to resist him," said the man whose intellect had made the great shell possible, and whose love for a woman now inspired him to employ its deadly power.

Inquisitively, the Bat-men approached the breach in the wall. They were few at first, and somehow did not emerge. But grottoes inside the wall as far as the glasses could reach emptied themselves of the hairy, winged creatures. There were thousands of them. A new day had dawned in the Taga kingdom, and now anything might be expected.

Lighter grew the heavens as the glow from the rising sun mounted higher. Meanwhile, the five on the projectile waited and watched.

The Taga horde, as though by common consent, came forward in a direct line.

"They have seen the projectile," whispered Horo.

Into Nothingness

THE first Bat-men to arrive continued to wait for the others, as though they had sufficient intelligence to put a value on the weight of numbers. And then, reinforced by hundreds, the leaders took wing and made for the opening.

The projectile was outside the wall and above it, so those in the great shell looked down upon the flapping horde. Both Horo and Tor Floro were nervous. Not so the three others, who knew full well that the blasting fury of atomic power could defeat the Bat-men, regardless of numbers.

"Careful, my friend," implored Horo at Dr. Fry's elbow, "lest they emerge!"

The reply to his warning was a withering, fan-shaped flame as the scientist touched a control and released the power. The blast struck the Bat-men, enveloping them.

Then Horo and the beautiful Martian girl were aghast at what they saw. The Bat-men had vanished, had disappeared utterly in mid-air!

"Where did they go?" asked Horo of Dr. Fry, who stood ready to meet the next assault from the horde.

"Into nothingness, my friend," said the Earth-man. "They were consumed, annihilated."

The master of sciences and high priest of Osin was astounded. There had been hundreds of the Taga on the wing, then a blast from the projectile and they were gone—out of existence—into nowhere. He looked again as other Bat-men took the air. Again the rapid thrust of flame and the creatures disappeared. But more came. And there issued from the great shell again and again the blasts that meant their destruction.

Presently, the attacks from the horde grew weaker,

and at last the few that remained turned and made their way back to the shelter of the grottoes. And just as the last ones disappeared and the sun rose above the rim of the crater in the distance, hundreds of Osinians were seen approaching from Tara, which lay only a few miles from Dir, and which, but for the projectile's timely arrival, would now have been at the mercy of the Taga horde.

Ken Mahu descended from a height above the projectile to report to Horo that he had already warned Tara of its danger. He pointed to the small army of men on the march.

"They are coming to repair the wall," he explained.

"How long should it take them, Ken Mahu?" asked Dr. Fry.

"One thousand men are coming," replied the flying captain. "If not molested by the Taga, they can complete the work in a day and a night."

"They shall not be molested," promised the scientist.

"But the Taga—they may come," Ken Mahu suggested.

"They have come already," advised Horo.

"And where are they?" inquired the flying captain.

"Gone," said Horo.

"Back to their grottoes?"

"A few got back," Horo told him, "but most of them were slain right here, and there were thousands."

Ken Mahu, his craft stilled beside the projectile, bent his eyes upon the ground.

"But their bodies?" he asked.

"Have disappeared — vanished — gone — become as nothing," said Horo.

"And how was it done?" asked the amazed flying captain.

"By the employment of a secret power operated from the Sjorian projectile," explained Horo. "And you, Ken Mahu, shall warn Avin to cease forthwith all demonstrations against Osin. Tell their Kor of this power possessed by the men from Sjor, how it can utterly destroy and annihilate anyone or anything with which it comes in contact. Tell him another breach in the wall about Dir will be as a curse to him and his people."

Ken Mahu had been gone but a few minutes when specks were seen between the craters of Dir and Avin. The powerful telescope mounted on the projectile revealed them as flying captains in the service of the Avinian Kor. They were moving slowly, evidently heavily burdened. Obviously, they were carrying more explosives with which to bombard the walls of Dir.

Dr. Fry prepared to ascend if need be. He was determined to circumvent them.

On came the Avinians, apparently bent upon deviltry. They skirted at a great height the walls of Dir on the side next to Osin. They probably were selecting a point of attack.

Suddenly the projectile shot upward at terrific speed. The Avinians were bunched. Beyond doubt, their plan was to drop the explosives together and tear out another section of the wall.

It seemed to those on the projectile that the Avinians had not observed the great shell's approach, or had misjudged the rapidity with which it neared them. At any rate it was upon them before they could separate or drop their explosives.

Without warning, a withering blast from the great shell enveloped the Avinians in mid-air. There was an answering crash as the explosives went off, and then a puff of smoke and a great burst of flame. But the next moment the projectile swung in the air above the craters of Dir alone.

The Avinian flying captains had vanished. They had disappeared as a bubble that has burst. It was quite as though they had never been at all.

CHAPTER XVIII

Defiance from Avin

KEN MAHU arrived from Avin the next day. The Osinian workmen had just finished their task of repairing the wall and had set out for their homes in Tara when he came. The projectile was waiting for him above the walls of Dir, with those on board eager for news of his adventure.

But Ken Mahu had failed in his mission. Horo and the others sensed it the moment he stilled his craft beside the great shell to report.

They had laughed at him in Avin. He had seen both the Kor and Terno, the chief adviser. And, in derision, they had feasted him in the palace with a gay company invited.

Terno, much to the amusement of the Kor and his guests, had told him to feast his fill for he soon would be empty with Osin devastated and despoiled. For the Avinians, boasted Terno, after hearing Ken Mahu's warning, had even greater machines of destruction than the men from Sjor could conceive, and these should be employed, together with the Taga horde, to blot Osin from the planet of Turinia.

Horo was quick to observe the effect of the flying captain's report on the earth men. He was gratified to note that Dr. Fry's face flushed at the comparison, which betrayed the fact that the Sjorian scientist's pride was stung. But now Horo, himself, was to be made the victim of a comparison so odious to him that his emotion was easily perceptible.

For, said Ken Mahu, Terno had boasted of a secret power held by the Avinians, whose master of sciences and high priest was by far the most powerful in existence. And then Terno had told the flying captain to return to Horo, the novice, and his friends from Sjor and bid them prepare for the oblivion into which they were about to be hurled.

Horo knew Terno had lied. He was familiar with the scientific progress of the Avinians and was aware that the boast of the man was an empty one.

"Did you see any preparations for a further demonstration against Osin?" questioned Horo.

"Oh, yes. Terno was quite willing that I should see what they were planning," replied the flying captain. "He showed me vast supplies of explosives with which they will immediately attempt to destroy a much larger section of the wall enclosing the Taga."

"The projectile destroyed a detachment of their flying captains sent to drop explosives during your absence, Ken Mahu," advised Dr. Fry.

"I am sure they don't know that in Avin," said the flying captain. "They are coming in force at sunset, determined to liberate the Taga horde."

"What do you make of this attitude on the part of the Avinians, Horo?" asked Randolph, who was puzzled by their defiance.

"Simply this," explained the master of sciences and high priest of Osin. "They did not believe Ken Mahu when he told them of the projectile's annihilating power. They think we are helpless, and, no doubt, they will attempt to carry out their plans as Terno has threatened."

"And you doubt that they have weapons such as were described to Ken Mahu?" asked Dr. Fry.

"I know they have not," declared Horo with emphasis. "Yet," he added, "the situation is serious and, perhaps, dangerous."

"Just why?" inquired Randolph.

"Because they are ignorant of your power. They will go to any lengths to avenge themselves upon us."

"In that case, then," suggested Dr. Fry, "the only thing for us to do is to give them a demonstration that will be convincing."

"By all means," agreed Randolph, and both Alicia and Tor Floro echoed him.

Horo now saw an opportunity to make a bold stroke for his beloved Osin. He had seen the ancient ruin crumble into dust before the withering blast of atomic power, and he had witnessed the utter annihilation of powerful living creatures. And now that he saw the wisdom of his Sjorian friends' argument that Osin had left herself unprotected while the Avinians had built their wall and were secure, he conceived the idea that a way to remove this inequality was at hand.

"My friend," said Horo, addressing Dr. Fry, "tell me whether the power you have is limitless. Could it be employed for a gigantic enterprise?"

"Indeed, yes," said the Earth-man. "What have you in mind?"

"That the projectile be used to destroy the wall around Avin!"

The old man's eyes burned as points of fire. He was now become a warrior, indeed, one who would go to any length to save his beloved Osin from a further menace.

The Earth-men and Alicia were surprised at Horo's suggestion. Meanwhile, Tor Floro, an Osinian yet, for all her willingness to leave her own world, thrilled at the old man's words. This, she knew, would give Osin its greatest protection. For with the Avinian wall destroyed, no further attempts to release the Taga would ever be made. It would forever be to the interest of both nations to safeguard the walls about Dir.

"Is it—too great—a task?" Horo spoke haltingly, fearing he might have asked too much of his friends who had already performed a miracle in saving his beloved people

"Oh, no, indeed, dear friend Horo," declared Dr. Fry. "That will not be at all difficult. And, under the circumstances, it is the only thing to do if Osin is to be safe in the future. I shall be happy to do it, my dear friend."

"He really can do this thing?" Tor Floro inquired of Randolph. Her interest was as quick and deep as was Horo's.

"I assure you that he can and will," replied Randolph, looking down into her upturned eyes.

"Then Osin will be safe," murmured the girl, "and you of Sjor shall be enshrined in the hearts of the Osinian people forever."

"But you, Tor Floro," whispered Randolph, drawing her aside, "would not go back to Osin? You will go with us—with me to another world?"

And now Tor Floro knew her heart, and was gladder than she had ever hoped she might be.

"I have chosen," she told him, "and I shall go on to Sjor—anywhere to be with you."

"For love of me, my own Tor Floro?" asked the man.

"Yes," she confessed, "for love of you, Henry," and, before them all, he took her in his arms.

Meanwhile, Alicia, whose affairs of the heart were already settled, had been scanning the heavens with powerful glasses. Suddenly she called Dr. Fry's attention to aircraft coming from Avin. There were more than a dozen of them.

Horo and Dr. Fry studied the approaching fliers, who evidently had been sent out by Terno from Avin with explosives for another attempt on the walls of Dir.

Dr. Fry decided on immediate action. Up shot the projectile at tremendous speed till it commanded from its great height the entire area of Dir. And there it hung, waiting.

On came the Avinian fliers, as though they had not seen the projectile, or, seeing it, did not fear its presence. It was evident that nothing had been known in Avin of the terrible fate of the other flying captains, who had vanished in an instant under one blast from the great shell. Terno, no doubt confident that Ken Mahu's message of warning had been exaggerated by design, had probably told the fliers to have no fear of the Sjorian projectile.

The Avinians flew close together, which betrayed their purpose. They were plainly planning to drop their explosives simultaneously on the wall in an effort to demolish a much larger section than before.

There were fourteen of them, as the count now showed. They could carry, Horo declared, a sufficient amount of explosive to tear out a section of the wall many times larger than the first.

But Dr. Fry was watching, and when the Avinians reached the middle of the area of Dir, bound for the wall next to Osinian territory, the projectile descended with incredible swiftness. It was like the swoop of an eagle upon its unsuspecting prey, but swifter and more terrible.

The Avinian flying captains never knew anything about the punishment imposed upon them. Plunging downward like a plummet, the great shell sent one fan-shaped blast. A puff of smoke was seen, and a moment later came the report of the explosion. And then—! There was no sign that the Avinians had ever been! They were obliterated, made into nothingness.

Then, with the flying captains of Osin on guard to report any more efforts to destroy the wall, and with Ken Jari speeding to Hio with news of what had been done, the projectile took course for Avin. At last the

Avinian Kor and Terno, his chief adviser, who had mocked Ken Mahu and made sport of the Earth-men and Horo, were to have a demonstration of a power of which they had been duly warned but which they had not feared because they could not conceive it.

CHAPTER XIX

The Great Wall Crumbles

HORO exulted as he pointed out to the Earth-men the capital of Avin, the city of Murn, toward which they were speeding. For now, if, indeed, the projectile could encompass the destruction of the hated wall, his beloved Osin would be safe from the Taga forever.

The steel shell had ascended to a great height, and the large telescope was employed to prevent more flying captains, possibly sent out by Terno with explosives, from passing beneath unseen.

"It is not likely, however," advised Horo, "that another effort will be made without Terno knowing what happened to his other expeditions. So, if we act quickly, I am confident there will be no more attempts to release the horde upon Osin."

"We shall lose no time," promised Dr. Fry, as the projectile was dropped to a lower level to begin its work.

The arrival of the great shell, which the Avinian populace had never seen before, brought vast crowds into the streets, who shouted in derision as the projectile was stilled to permit Horo to warn them away from the wall. But the throng retreated, despite its shouts of derision, and immediately Dr. Fry touched the controls to reduce the piles of masonry into nothingness

Panic fell upon the Avinians as the blast of atomic power melted the ancient wall from their vision. The withering flame shot out, enveloping long sections of the wall, which disappeared on the instant. Terror-stricken, the populace stood rooted to the ground as the work of destruction went on. The labor of a thousand years and Avin's greatest pride was failing and falling before the magic of men from another world.

The great shell moved on, pouring a steady stream of atomic power upon the stone. Horo gasped and marveled at the speed at which the projectile moved in its miraculous work. It was surpassing by far his highest hopes. At this rate, complete annihilation of the Avinian wall soon would be accomplished.

As the projectile moved onward, Horo recognized the palace of the Avinian Kor, which stood in an open space, a great building of brilliant color and exquisite architectural design. He pointed it out to the Earth-men, and on the instant there emerged from the palace in a fury of excitement a small group.

Horo took the glasses and studied the Avinians carefully.

"It is the Kor himself," said the master of sciences and high priest of Osin. "And beside him is Terno, his chief adviser. But I fear there is little that Terno can offer now in advice and counsel."

But Terno was a leader both resourceful and courageous. As he witnessed the destruction wrought by the projectile, he ordered out the remaining flying captains with explosives. They took the air at once, and began to ascend, obviously in an effort to get above the great shell from Sjor. But the projectile rose more swiftly than they, and a few blasts of atomic power wiped them out of existence.

And now came Terno, flying directly toward the projectile. But he came without weapons of any kind, and, guiding his craft on a level with the great shell, sought parley with those on board.

Horo replied to him, as he begged for mercy in the name of humanity.

"Ah, Terno," said the master of sciences and high priest of Osin, "you ask mercy who never knew what mercy was! It was your plan to free the Taga horde for Osin's obliteration. You plotted to wipe a defenseless people out of existence. There is no mercy for such as you and your Kor!"

"But we would pay any ransom," pleaded Terno, "if you only will cease. You are destroying the work of a thousand years. You are exposing all Avin to danger."

"There is no danger to Avin," replied Horo, sternly, "if Avinians do not tear down the wall enclosing the Taga."

"But we'll pay, we'll pay!" wailed Terno, who feared his plea was hopeless. "And we'll sign any treaty Osin presents. Have mercy, have mercy!" he screamed, he who had so recently made sport of Ken Mahu in the Kor's palace.

"Ah, Terno," was the reply, "you will pay—afterward. When we have destroyed your greatest weapon against Osin, which is your own security against the Taga horde, we shall come for an indemnity."

Then the projectile moved on, destroying the wall as Terno screamed out beside it his prayers for mercy. But Horo made no further reply, and at last Terno flew back to the palace and they saw him no more.

The Destruction

AS the great shell continued its flight of destruction, those on board witnessed the strange sight of Avinians deserting their homes and fleeing long distances. They encountered deserted cities and towns which the people had left in mad panic. But on swept the projectile, ever destroying Avin's power for evil which had inspired in Horo such great dread.

But Avin was a large nation, and days were required for the work. As it progressed, Horo felt sure that Osin was now safe. He knew there would be no further efforts to free the Taga horde, for now Avin also was exposed.

Horo wondered at times what his own reception in Hio would be when he returned. Would the Kor punish him for aiding the Sjorian virgin's escape? And Tor Floro, too, who had been the betrothed of Hanya—would the Kor, her brother, demand her return into his and Hanya's hands?

Yet Horo, master of sciences and high priest of Osin, had no fear of the results of the exploit he had made possible. For had he not performed the supreme service for Osin? Had he not saved it from ghastly destruction by the Taga horde? And even if condign

punishment were inflicted upon him, could he not suffer it for the sake of his beloved country and people, happy in the knowledge that he had saved them?

But there were other minds than Horo's thinking of all these things, as the projectile from another world continued its flight around Avin, blasting its wall into nothingness. Tor Floro knew only too well what the wrath of her brother could be. And she knew Hanya. She wondered what fate might befall the old man!

And Alicia and her friends, all of whom loved Horo, thought about it as the projectile went on with its work. The Earth-men suspected that Horo would be made to suffer a penalty. They knew they were safe, as were Alicia and Tor Floro, for they were determined they would not leave the projectile again to set foot on Mars. They would leave for their own world as soon as possible. And Tor Floro, now betrothed to Randolph, would, of course, go with them. But Horo, they knew, would insist on remaining in Osin to the end.

"Horo, my friend," inquired Randolph, "what do you suppose will happen when you return to Hio?"

The old man did not reply at once. But he regarded his friend from Sjor quietly, no fear in his eyes, no worry showing on his face.

"My son," he said at length, "I am an old man, and when I return to Hio, as I shall regardless of circumstances, I shall be more content than at any time in my long and busy life. What I have done may stir the wrath of the Kor, but I shall be happy to have achieved so much for my people. There will be no sacrifice, whatever my fate."

"Ah, Horo, my dear, dear friend," declared Fry earnestly, "if you cannot return to Osin with the proper appreciation of your service shown, don't forget that we can work our will upon the Kor and Hanya despite their authority. What you have done for us we can never repay. You shall suffer nothing. I swear it! If the Kor and Hanya do not bind themselves as we shall dictate, they shall pay a forfeit themselves that I promise will be heavy. And then, my dear Horo, if Osin does not want you, we take you to our own world with us!"

Tor Floro's eyes were shining as she smiled to encourage the old man she had known and loved from babyhood.

"Master, go with us to Sjor!" she implored. "I should be happier if you would. I don't trust my brother, the Kor, and Hanya—" she shuddered—"you know Hanya is unspeakable!"

"But no, my daughter," replied Horo firmly. "I return to Osin, to Hio. I shall go back to the Por Lito and let them do what they will!"

The Earth-men, however, were determined he should not return unless Osin acclaimed him. Horo had done too much for them for anything else to be permitted.

A Final Threat

THE populace of the capital city of Murn turned out to witness the completion of the projectile's terrible work. Thousands stood massed along the section of wall left standing, but they prudently kept at a distance that would permit free and easy operation of the great shell. The Earth-men had eloquently and tragically demonstrated the force at their command, and there was none in all Avin eager to challenge them.

Both the Kor and Terno were present when the last fragment of the ancient wall was blasted out of existence by the terrific force of atomic power. A great sigh went up from the populace as the work of demolition was finished, and now the projectile hung above Murn for a little while before returning to Osin.

The Avinians were silent—even Terno, who had pleaded for the wall, though knowing his plea was not justified. The Kor stood looking sadly at the destruction wrought, but he proudly returned the gaze of the group on the projectile. And to the Kor Horo now addressed himself.

"Thus, Kor of the Avinians," said the master of sciences and high priest of Osin, "has your country been reduced in power for evil. You are now no more powerful than Osin, and, while it may seem to you that the price you have paid for your perfidy has been great, be content that your situation is not worse.

"Nothing has been molested in your country. Avin has not been harmed. Your palace still stands. Your people's homes and places of business, your institutions and your edifices are all untouched. Yet remember that the force at the command of my friends from Sjor could easily have wiped all Avin out of existence. You and your people, your culture, everything you have and are—all could be made into nothingness in much less time than was required to destroy the wall.

"But you, Kor of the Avinians, and your people have been spared, all but the unfortunate flying captains whom Terno sent to their death in an effort to destroy Osin. The broken wall at Dir has been repaired. You will never break it again, for you will not want the Taga horde rending Avin as you and Terno plotted for them to rend Osin.

"No doubt, Kor of the Avinians, you will be required to pay an indemnity to Osin. I shall leave that to my government. In addition, you will be required to sign a treaty, unless I err in saying I know what the Kor of Osin will demand. And now, Kor of the Avinians, have you anything to say before we depart for Hio?"

The Kor of Avin, a man in middle life and of haughty mien, dared, despite the manner in which his country had been humbled, to make a threat.

"Know you, Horo," he said coldly, "that Avin shall yet be avenged upon Osin. Nor shall we pay an indemnity. We owe Osin nothing but punishment for what you have done to Avin, and to the memory of Avinians for centuries, in the destruction of our wall, our safeguard. I have spoken, Horo, and now you may be gone."

Dr. Fry had listened to Horo's statement and was surprised to hear such a defiant retort from the Kor after what had been done to render him impotent. But he bethought himself of a warning he now might give the ruler of the Avinians in supporting the position of his beloved friend, Horo.

"Have a care, Kor," said the Earth-man, sternly, speaking in the language of Turinia, "lest you invite disaster. Horo, master of sciences and high priest of Osin, has warned you that an indemnity may be demanded of you. But you reply disdainfully and threaten

Osin again. I had thought, Kor of the Avinians, that you were more intelligent!"

A deep flush spread over the face of the Kor, but he was under splendid self-discipline and did not reply.

Dr. Fry continued. "Beware what you do! My friends and I shall soon leave for our own world, but, before departing, I shall give into the proper hands in Osin the secret of the power you have seen demonstrated here. As master of sciences and high priest of Osin, my friend Horo, himself, shall hold over Avin, as shall his successors, a force against which you dare make no resistance. Think of that, Kor of the Avinians, before completing your plans for revenge!"

Horo, his face beaming, embraced his friend from Sjor who now caused the projectile gently to ascend. Then, while the Avinians watched and their Kor stood staring into space with the Earth-man's words ringing in his ears, the great steel shell shot at terrific speed for the city of Hio in Osin.

When the projectile, its work behind it, at last hung over the city of Hio and those on board pointed out the Kor's palace, the Por Lito and other landmarks, a stir was seen on the ground far below. Hio seemed literally alive with people, apparently moved by an undercurrent of excitement. This became more marked as the great shell settled to a lower level, and at last it was plain to all on board what was under way. It was a spontaneous welcome from the populace.

A Wedding in Space

HIO was gayly decorated as though for a festive occasion. Throngs were gathered on the grounds of the Por Lito awaiting the landing.

Cheer on cheer rose from a multitude of throats as the great shell was stilled a hundred feet above the ground while those on board held council together. For a while this obviously was a celebration in honor of the Earth-men and Horo, Fry and Randolph, urged by the two girls, insisted upon caution.

"The Kor, as you know, Horo," reasoned the scientist, "has been outwitted. And while he really has no grievance against us in justice, he may feel aggrieved nevertheless."

"But you have saved him and all Osin from destruction," argued Horo, "and my people are gathered below to do you honor."

"That is true, master," agreed Tor Floro, "but I fear Hanya and I shall fear him so long as we both live on Turinia. And I know Hanya has a powerful influence over my brother, the Kor."

"It were better, Horo," advised Randolph, "that we wait and make sure just what the situation is. I for one am unwilling to run any risks whatever."

So they waited while the concourse of Osinians grew larger in celebration of their return. None could doubt, as they looked down upon the people from the great shell, that they were friendly. Yet all knew that the word of the Kor was law and that Hanya might sway the ruler against them.

As though in answer to their wishes, Ken Jari, the flying captain, was now seen making his way in the royal carriage, which meant that he bore a message from the Kor. The people fell back and made way for him. Meanwhile Ken Jari's handsome countenance shone proudly, and this was taken as an augury that he brought good news.

The Kor, Ken Jari announced from the royal carriage, would welcome them at the palace, and would permit full freedom of action to the visitors from Sjor. For it was known in Hio what the Earth-men had done in Osin's behalf, and they were regarded far and wide as the outstanding heroes in Osinian history. So, if they would come to the palace, the Kor would be glad to honor them.

"But, Ken Jari, my good friend," inquired Fry, "what of Horo and the Kor's sister, Tor Floro? Tor Floro is the promised wife of my friend, Randolph. Does the Kor hold them responsible in any way?"

"I was bidden to say," declared the flying captain with a smile, "that our master, Horo, is to be elevated in power. He is to take the place of the despised Hanya as chief adviser to the Kor of Osin."

"And Tor Floro, my promised wife?" asked Randolph.

"It is my happiness to inform you," the smiling Ken Jari replied, "that it was the good Kor's pleasure to select his sister of all the maidens in Osin and offer her as your bride to reward you for your service to his people."

"And the Sjorian virgin?" inquired Fry.

"The Kor commanded me to say that he and all Osin should feel aggrieved if you and the beautiful Sjorian virgin did not consent to be wedded in the palace by our master of sciences and high priest, Horo, himself."

"Then, my beloved," murmured Tor Floro, happily, "there shall be a double wedding in the palace before we journey to Sjor."

Horo, master of sciences and high priest of Osin, and now chief adviser to the Kor, his heart full because of such expressions of gratitude, blessed the lovers where they stood with the great throng acclaiming them. Then the great shell settled to the ground where stalwart guardsmen, under orders from Ken Jari, stood watch to protect it. But this was quite unnecessary, for there was none in all Osin, save, perhaps, Hanya, now reduced to impotence, who would not have defended it with his life.

Then Horo and the two happy couples, accompanied by the smiling flying captain, entered the royal carriage and drove in state to the palace between long lines of cheering, happy Martians, whom they had saved from the Taga horde and the vindictive Avinians.

* * * * *

A double honeymoon in space—two courageous men and their no less courageous brides—unending night outside the projectile as the great shell shot as a comet back to the earth—absolute zero without, but within the warmth of love and the thrill of adventure!

Mars, or Turinia, lay far behind them, diminishing rapidly in size because of their terrific velocity. And out in space beyond hung the Earth, or Sjor, whither they were bound.

Then after three weeks had passed with the projectile speeding more than one and one-half million miles every twenty-four hours, the quartet neared the

(*Concluded on page* 179)

By the Author of "The Day of Judgment."

WILLIAM TREVETHEN, loosening the last of the scale which coated the rows of boiler tubes upon which he sat, pitched his scraper away and rolled half-over to rub the painful corrugations pressed into his thigh by the round pipes. Tossing his caged electric bulb out through the open manhole above him, he got upon his hands and knees stiffly, preparatory to standing up and elbowing himself through the opening. Three forty-five P.M. by the boiler-house clock.

"Bill! Oh, Bill!" Twenty-five minutes later Jack Brinston stood upon the brick floor just inside the door, calling his co-worker. His eye fell upon the light-bulb hanging at the end of its cord beside Boiler No. 4, then traveled up over the rounded sweep of grimy steel exposed above the brick foundation. His glance finally came to rest upon an oval plate, from the center of which a long, inch-thick screw protruded.

"Damn that guy anyway! That's what ya git fer havin' a lousy cousin on the shift ahead! Lazy katoot not only can't finish his job but hasta leave me put the cover back on, just 'cause I'm ten minutes late; an' I'll bet he never flushed the scale out o' the bottom either. Well, I gotta get steam up f'r th' evenin' load by five-thirty; 'f I scale-burn somethin' I'll see't he's the guy't gets the hook fer 't!"

So saying, along with many other things that were more within the linguistic limits of a power-house fireman than those of decency, Jack climbed to the top of the boiler to replace the manhole cover, which by rights should have been a two-man job.

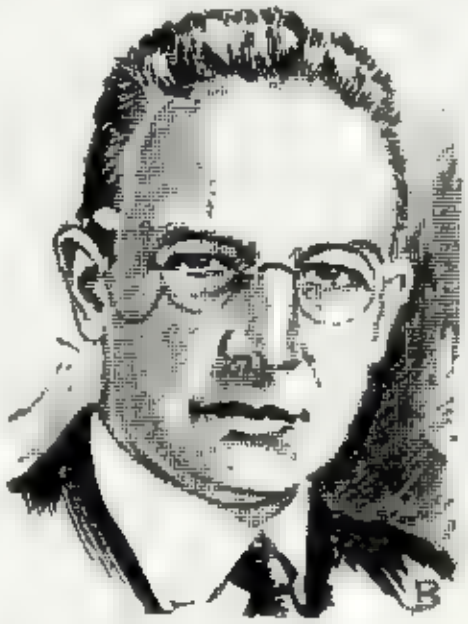
The cover is an oval piece of half-inch steel, just large enough to cover a hole admitting a man's body, and is curved to fit the contour of the top of the boiler. It fits on the inside against a metallic gasket. The purpose of the manhole is to allow a mechanic to get inside the boiler, either for repairs or to scrape off the encrusted scale, which, in course of time, decreases the steaming qualities. If allowed to thicken too much, it ultimately causes the tubes or boiler sheets to "burn"; that is, to be weakened by high temperature through the inability of the water inside the boiler to disperse the heat fast enough. Bill had been engaged in scraping the scale from the rows of tubes, while sitting on top of them inside the boiler.

Wrestling with the heavy plate and spider, emitting grunts and maledictions of a force commensurable with the effort, Jack at last got the orifice closed, and, cursing the delay, turned on the water from the street main, busying himself with the other boilers while the water gushed in with a metallic tinkle. By the time water showed in the gauge-glass, the oil-burners, driven from the next battery of boilers, which had been under steam all day, were already emitting their gasping roar from the other three fireboxes in this room.

Jack allowed a pool of oil to run into the bottom of the firebox, soaked up a piece of waste, lit it, and was about to hurl it in, when he suddenly leaned against the boiler-face with closed eyes, while the burning waste fell from his hand to the floor. For a moment he remained thus, then moved unsteadily to seat himself on a box.

"God, I feel awful! Jest as though somethin' had all gone wrong somewheres, 'n I can't remember what. Guess'll hafta lay off the night life before I get the heebie-jeebies f'r fair!" He moved about uncertainly, frowning and shaking his head; then suddenly, as his eye fell on the boiler-room clock, twitched his shoulders roughly and picked up another piece of waste.

Half an hour later, listening to the gentle singing of the water within the boiler, he suddenly shivered, and began walking about uneasily, a dull, wondering alarm in his eyes. A few minutes later he was watching the boiler-head fixedly, unconsciously backing away with the demeanor of a man looking at a suspected infernal machine.



VICTOR A. ENDERSBY

ALTHOUGH this is a short story, the editors really rank it among the best they have received. It is full of humor, pathos, tragedy and deep wisdom; and yet it is exciting from the start to the finish.

It is difficult to analyze the science of this story in order to show what it proves, for it has a bit of many sciences in it. And each is worked out with the skill and care of a man who knows what he is writing about. Mr. Endersby, we might say, is blazing a new path in science fiction—a path that most of our readers associate with the name of A. Merritt. Those who read "The Day of Judgment," Mr. Endersby's contribution to the November, 1929 Cover Contest, in the April issue of SCIENCE WONDER STORIES, *will agree with us that we have here a writer of the first rank.*

* * *

The Tragedy

DR. MADDIX was talking across the table through curls of cigarette smoke, to his one-time classmate, now instructor in archeology at the local university—Professor Lawrence Kerney.

"Dam'dest I ever heard of," said Maddix. "There are some things about it—more the things I can imagine than what I actually saw—that make me feel squeamish sometimes in the middle of the night.

"I was driving home along Front Street from the

Industrial Hospital, when this bird Brinston dashed out of the boiler-house door straight across the street, sort of mad-blind, no eyes for the traffic at all. He landed on the pavement at the other side, saw the wall in front of him, and turned around two or three times like a poisoned dog. Then he got his feet under him and his tail between his legs and was straight off for the docks at the end of the street. I backed into an alley, got turned around, and went after him hell-bent; suicide or nuts, I thought. He hopped a foot when I got hold of his arm on the pier, and just gibbered, stabbing in the direction of the power-house with his finger. By this time, as you may imagine, I was getting the jumps myself, and God only knows what I was expecting to see.

"There was nothing much at first. Three burners were going full blast, but No. 4 boiler was cut out and the fire killed. The manhole cover was off and steam pouring out of it. I was beginning to realize what kind of horror I was up against, and I was about as shaky as Brinston by the time I got to the top of the boiler.

"Well, I let a bulb into the boiler, and waved it back and forth; but the steam pouring out was so hot and thick that I had to shake enough sense into Brinston to get him to fan air into the hole with a big piece of canvas—noticing incidentally that most of the skin was off his palms and knees where he had been fighting the hot manhole cover. My own shoe-soles were beginning to heat up and stiffen on me. After a minute or two I got enough used to the steam and dark in the boiler to make out a blurry white patch. At this point Brinston went goofy and tried to climb into the boiler. But there was no use having two cooked corpses on hand, so I drove him back, feeling a little cooler myself. I realized there was no need for hurrying now.

"I got a piece of rope—there was quite a mob around by now—looped it around the victim's shoulders; and we dragged him to the top, finding that he had been floating mostly upright in the space between the boiler tubes and the outside shell, with his chin resting on a board which he had taken into the boiler for a seat on top of the tubes.

"God! When I saw that the man was *actually still breathing* I knew exactly the feelings of a man who meets a ghost! I'd as soon have expected to pull a live rooster out of a chicken-pie! I guess it was nothing but the fellow's good luck that gave me the instantaneous series of inspirations that saved his life.

"First off, his appearance showed that the skin was entirely cooked loose from his whole body, and I realized that the pressure of the rope around his shoulders was probably skinning him like a shedding snake. So I had it belayed to the steam drum, not daring to pull him on out through the metal rim. A queer recollection of some child-birth injuries—to the kid, I mean—flitted across my mind. Funny what a man can think of at such times!

"Next I hopped off the boiler, set some of the men drawing hot water into a small galvanized tank which was in the room, and rushed for a phone. There I started scraping up the biggest order of materials for Carrel-Dakin solution that anyone had ever asked for at one time. I don't know whether you know about the stuff; it saved countless numbers in the big war. It's generally applied to a deep wound by branching rubber tubes, which keep the injured tissues constantly bathed in it. Under those conditions no infection is possible, and the injury heals the right way—from inside out. I thought, if you can't fill the wound with it, in this case, you can fill it with the wound!

Fast Work

"I KNEW it would be hours before we could get the stuff organized, and in the meantime I was taking a desperate chance, but the only one I could see. I had the galvanized tank full of good hot water hoisted up to the boiler-top by a chain-block hung to a roof-truss. Then we got two or three soft bandage slings under the body and gradually worked it out through the manhole, sousing it at once into the tank. I cut off the clothes as gently as I could, and exposed the whole body under water. Big patches of skin had come off with the handling, but I was interested to note that the cooking had seemingly just affected the skin, leaving the flesh underneath pretty healthy. I began to feel that my hunch had been right, and that I was about to get my hat plumed for the most spectacular piece of life-saving in the history of medicine around these parts.

"You know a few years ago we used to treat burns by covering them up with this and that—exactly the wrong thing to do. It's not the local injury that does the killing, but the absorption of toxins into the body from the burned tissues. Nowadays we treat major burns by scraping all the damaged skin and flesh from the injury and applying something—often paraffin.

"In this case I didn't think I would be up against a nerve-shock, for the reason that you can boil the flesh off a man's hand without pain, if you keep it in the water as you heat it up. The sensitivity is gradually killed. Obviously this heating had been gradual.

"I didn't want to pull off the skin until the solution was on hand, but I got worried about the effect of the toxins while I waited, and took a chance. I had chloroform on hand, but didn't need it; he stayed dead to all things mundane for hours. Well, I peeled him completely except his head and neck, which were merely badly scalded. There was a cut on his head, and from all the evidence I could gather, he must have slipped as he started to straighten up to climb out, hitting his head on the edge of the manhole. Either through luck or some dazed movement for self-preservation, he got his head on the board and floated, while his cousin came in, thought he had gone, and closed up the hole after yelling for him.

"According to the cousin's story, it never occurred to him that the man could be unconscious inside; in a well-regulated plant a man in the boiler always leaves a warning sign outside. Therefore Brinston was justified in firing the boiler. But later on he was seized with an overpowering hunch that something was wrong; he cut out the boiler and took off the plate. Then he went plumb ga-ga. No wonder! But that was nothing to what happened when the damn fool, moved by some horrible fascination, edged up to look into the tank after I had taken the skin off the body. We had to send him temporarily to the psychopathic ward then.

"After I had done all I could, and had to wait for the arrival of the solution, I worked on the problem why the fellow hadn't smothered in the steam. I tell you, Lawrence, the darned incident was, in itself, a whole education in medicine! But as to the last point, I knew that water ordinarily has a lot of entrained air, which is driven out as it is heated up. No doubt Trevethen was furnished with a small amount of fresh air mixed with the steam right up to the time Brinston opened the boiler. Being unconscious, he was breathing lightly and using up no oxygen by struggling. The water had just about come to a real boil when he was rescued.

A Queer Case

"WELL, he was still alive when we got the water switched for Dakin solution, although I had to use an oxygen tank on him a good part of the time to make up for the respiratory area of the skin of which he was deprived. And, by the way, the biggest problem we had in the hospital was to get oxygen applied to enough of the body surface. Christians plastered with gold leaf by the old Romans, you know, used to pass out in a few hours from asphyxia.

"But that's the story! Now he's out as good as ever, with a nice new baby skin. And I'm cock-a-hoop with the medical profession as I would never have been after a mere forty years of good honest work!

"However, his hard luck didn't end there. His fiancée, who had once before been a bit hipped on Brinston, was all love and commiseration after the accident; but when he was pronounced safe, she had some kind of reaction. Used up all her affection in one big flame, I suppose. Anyway, as soon as he was up and around she broke with him and married Brinston. And as though that weren't plenty itself—though between us I think he's lucky to lose her—some old aunt died, leaving her a regular fortune. So Brinston not only skinned Trevethen literally, but took his girl and his prospective fortune. But of the two, I think Trevethen's the luckier! Brinston's a broken man. His conscience hurts from all three wrongs, though heaven knows they were all unintentional; and his system has never recovered yet from the shock."

Professor Kerney puffed for a moment rather rapidly though abstractedly.

"Edgar, it's a queer world," he remarked. "Some of these things line up with a hellish ingenuity, a sort of demoniac cynicism, which sadly strains the word 'chance.' The world's full of such. And another thing—a thing which sometimes makes the world seem a pretty weird place to me—is that no matter how aimless a human action is in seeming, it is not so in reality. We think we are masters of the hourly action; but I'm telling you that there's a moving hand within the brain—the unknown dictator—they can call it 'subconscious' if they want to, for it's as good a word as any to express total ignorance—which uses our senses and organs as catspaws without our knowledge.

"I know one case where a fellow dropped an important document behind a wainscoting, while sorting some papers. He never had the least idea what had become of it, and suffered financially and personally all his life from the loss. But on his death-bed he described the location of the document correctly! *Something in him, Edgar, not only saw that document drop but dropped it on purpose!* Why?

"Take Brinston. That hunch was no hunch; it was subconscious knowledge coming out on top! Something in him *willed* to trap Trevethen, boil him to a turn, and let him escape! Yet that desire was so at odds with his normal, decent self, that its realization drove him temporarily insane, and will haunt him the rest of his life! And something in Trevethen willed that slip on the tubes! What do you know about Freud, Edgar?"

"I know that he ought to be spelled with an 'a'," remarked the doctor unkindly. "Once I was half-spoofed by him like most of the medical profession. But I found that he was one of those half-truths worse than a whole-hearted lie. He had a good idea, true in its own sphere; but he rode it to death. A doctor learns plenty about dreams that won't click with the 'suppressed-desire' theory.*

"In fact, Lawrence, I had the same idea about this case that you're thinking of. But I'm convinced that Brinston loves Trevethen like a brother, from a lot of things I learned from both of them while the latter was laid up. They formerly got along like cat and dog on the surface, but—the real thing was different. In fact, in the case of the girl, each wanted to step aside for the other; they ended it by letting her do the picking herself, uninfluenced.

A Terrible Dream

"BUT here's something I've been turning over in my mind—never told anyone else. In some ways it's Freudian; but I sense something more in it than that; something that disturbs me deep down and won't leave me alone. It's a dream Trevethen told me. He says he had it as he was unconscious in the boiler, but of course he wasn't rational in the head for long after, so you couldn't really date it. I'll try to tell it in his own lingo; it has more carrying power that way. It was this:

" 'I had a dream in that boiler, doc, that I jes' can't get away from. I gotta tell it to somebody, 'cause it won't let me sleep nights. I wake up now yellin' with the idea I'm really doin' the awful thing I dream about. It's like this: I'm sittin' on a big stone chair with lions on, in a hall as big as all outdoors, with a big crowd all aroun' dressed like some kind o' movies I seen. There's kind o' Egyptian-like pitchers cut in the rock walls all aroun', and a lot o' little triangle-shaped marks under 'em and aroun' 'em. The people has on high hats, kind o' runnin' up narrow to the top like chimneys, without no brim, and straps runnin' around 'em like leggins. The men all has beards curled up kind o' tight and black like Jew peddlers, only fixed up fine and tied in clubs like women's hair usta be when I was a kid. They all has sort o' skirt clothes and sandals. I dream I'm dressed that way too, only finer.

" 'The people is all ranged in two long rows in front, reachin' away to the end o' the hall. Right in front o' me is a great big copper kettle, I guess anyway six foot deep, settin' up on legs. Some soldiers is buildin' up a

* It is the theory of Sigmund Freud, the eminent psychologist, that all dreams are the result of suppressed desires.

fire under this kettle on the rock floor.' "

"Here," said Dr. Maddix, "he began to sweat and to twist at my arm. He had to gulp and choke several times before going on."

" 'Doc, they's a *man* in that pot! And the water keeps gettin' hotter an' hotter, an' he paddles aroun' grabbin' at the side an' lettin' go 'cause it burns his fingers, and' he looks at me with eyes that makes my blood freeze clear down to my toes. An' I'm holdin' a gal—an awful purty gal—in my arm, while she fights an' kicks, and ever' time this feller grabs an' lets go she squalls somethin' awful so it's ringin' in my ears yet. An' I got an awful yen for her that's just burnin' me up, an' I hate this feller so that seein' him suffer is jes' like pie. And the happy feelin' over him gets all mixed up with wantin' this gal an' knowin' I'm going to have her—'til I jes' seem to sort o' float like on a jag. An' all mixed up with it is a kind of awful horror of myself and ever'thin' else that makes me wanta die; I hate this feller an' have a terrible pity fer 'im, and feel the way I usta as a boy when I'd hurt a frog or mouse an' be awful sorry for it and hafta kill it to put it outa its misery. An' somehow all through it this feller seems to be mixed up with Jack Brinston—and—Oh Doc, Doc, it keeps comin' back to me nights! You *gotta* give me somethin' fer it!'

"That dream, Lawrence, haunted the poor devil until he began to get well, then it faded. And do you know, I met him in the street yesterday, inquired after his health; and when I asked him whether the dream still bothered him, he said, 'What dream?' "

Professor Kerney was glaring at his friend white-eyed.

* * * * *

"Why, what the devil's the matter with *you*, Lawrence?" said Maddix.

"Edgar, had Trevethen ever seen any Assyrian stuff?" Kerney said slowly.

"No, I happen to know that he hadn't. The nearest he had ever seen was some Egyptian stuff. That struck me too, so I showed him a picture of the Assyrian tire factory put up in Los Angeles by the Samson people—which'd be a good match for 'Ye Olde Gas Shoppe' out on the San Bernardino road. He clicked at once to the style of dress and the cuneiform writing as what he'd seen in his dream. But I ascertained positively that he'd never seen either the factory or anything else on the Assyrian line. Lawrence, for God's sake, have a drink! I didn't know you were so squeamish about surgical matters."

"That," said Professor Kerney, in a slow voice dragged with some effort from his larynx, "isn't what I'm squeamish about. Listen to this! We got in a new set of Babylonian tablets about three months ago. I've nearly finished the translations, on which I've been working nights."

He picked up his brief-case from its position leaning against his chair, and fumbled through a mass of sheets, finally handing one to Dr. Maddix.

The latter read painstakingly.

"Fixed on the West Gate by divine command of Damik-Khimitu the Mighty, King of Babylon, Lord of the Four Quarters of the Earth and Provider of Prosperity and Abundance for the Multitudes of Men; that the magnanimity of the Great King be made known to the inhabitants of the Earth

"It came to pass in the Year-of-the-Destruction-of-the-Kassites-at-Amara, that Nabu-Shapik, the Satrap King of Shur-Uppak, well-beloved half-brother, did refuse to the Great King his second wife, toward whom the Great King did condescend to extend his ennobling desire.

"Whereupon Damik-Khimitu the Great did cause to be brought in chains to Babylon the body of Nabu-Shapik the Satrap King, together with his second wife.

"And in the court of Babylon the Great, the King Damik-Khimitu did cause to be boiled in a copper vessel four cubits deep, the living body of Nabu-Shapik until the skin did loosen.

"Whereupon the Great King in his mercy did take from the vessel Nabu-Shapik, and did cause to be anointed with the magic balms of the royal physicians, the flayed body of the impious Satrap King. So that after the space of three moons, Nabu-Shapik was healed of his hurts. But the Great King did keep unto himself the second wife of Nabu-Shapik, and did abolish the Kingdom of Shur-Uppak, taking unto himself the lands and the cattle and the gold of Nabu-Shapik."

"Wouldn't you like to know the answer?" asked Professor Kerney in a voice which perceptibly failed of casualness.

Dr. Maddix laid down the sheet and selected a smoke, noting with some interest that the cigarette-case rattled against the table as he picked it up.

"No," he said slowly. "I don't think I would!"

THE END

THE MASTER ALLEGORY

By THE PLANET PRINCE

As I read beside the lamplight
On each pleasant summer night,
Thoughts come crowding to my memory
Earthly things are dropped from sight.

Something, coming from the Unknown
Seems to take me by the hand,
Lifting me above all mortals
Guiding me to some strange land.

Taking me to other planets
Over starry cosmic lanes,
Wandering along the spectrum
Exploring all the different planes.

Space means nothing, distance nothing,
For us Time is but a word,
And we travel through the ages
Seeing sights to man unheard.

And I marvel by whose power
(But 'tis told e'en as I ponder)
"I am the Vanguard of Knowledge
Making way for Science wonder.

"Though I'm but a formless vision
But an imaged thought-condition,
I'm the master allegory,
The great symbol—'Science fiction!' "

The War of the Great Ants

by Jim Vanny

(Illustration by Leonard)

The ant darted toward the Malay. David had no choice. He threw his revolver to his hip and fired.

WHEN David Marsden entered the Malay jungle on the first of May, 1945, little did he realize that he was entering upon one of the most astounding adventures ever to befall a human being.

Penetrating the interior with a party of five Malay "boys" for the purposes of surveying the territory near Southern Siam for a railroad, they had stopped for the night on the banks of the narrow, sluggish Tanum River, up which the party had been wending its way all day.

After the Malays had dragged the two gracefully carved dugouts upon the shore, they proceeded to a small clearing nearby. Here David broke away from the others, and while they proceeded to make camp and prepare supper, he took the opportunity of the few fleeting moments before dark to survey the surroundings.

JIM VANNY

They were in the interior of a tropical jungle. The vegetation was particularly dense; as seen only in these tropical forests where the decay of vegetable matter during ages past has enriched the soil to an unbelievable depth. From this has sprung a prodigious mass of vegetation in the form of huge trees, shrubs, underwood, creepers, thorns, and climbing and trailing vines, all struggling to reach the upper level of that almost unbroken growth.

Lateral branches are rare; instead they shoot straight and smooth, for a hundred feet before they branch out, cabbage-like at their summits. Ferns, mosses, orchids, and other parasitic plants in countless varieties cover the trees from top to bottom.

Immense vines that more nearly resemble ropes or great hawsers trail from tree to tree, up and down and over each other. They sometimes reach lengths of five or six hundred feet and appear to bind the jungle together in one great tangle.

Here indeed is the florists' paradise. Orchid plants abound on every side. To one on the ground however, their blossoms, like other flowers, are quite scarce. For it is the roof of the jungle that blazes with a myriad of wonderful colours, little or none of which is apparent from within.

David walked in a half circle from the clearing, coming out again on the river bank about two hundred feet above camp. The yellow waters of the Tanum flowed silently past on their leisurely journey to the China Sea. The sun had almost set and as David watched the blazing path it struck across the jungle stream, an object bobbing up and down on the little waves, passed before his eyes, slowly floating downstream with the current.

David's attention was drawn immediately from the beauty of the tropical sunset. Objects floating down these streams were not uncommon. Quite the contrary. Broken bits of cocoanut shell, logs, old clothing, even large trees when there has been a storm in the mountains above are often seen.

But this was nothing like that. It glittered in the last rays of the dying sun and as the young engineer started along the river bank to follow it, he noticed there were corrugated rings about it. No, it could not be a tin can—it was too large. Now David began running, arriving at camp slightly ahead of the floating object.

"Tok!" he cried, calling his head guide. "Quick! Come here!"

In a moment the Malay came running through the bush to where David stood on the bank.

"Look!" cried David, pointing to the shining object that was floating by. "I must have it. Quick! Get it for me."

In another instant Tok had plunged into the muddy waters. A few powerful strokes took him to the object and a minute later his dripping form was again beside David on the bank of the Tanum. In his arms he held a two quart thermos flask, similar to the kind the party carried in their own equipment.

David and Tok returned to camp where the Malays now had supper ready. But the first thing David did was sit down and give full attention to the mysterious flask. It was almost dark now but by the light of the camp fire, David turned to the flask. There was no cap on it, nor was there a cork. The neck of the bottle was plugged crudely with a roughly rounded piece of wood. By dexterous use of his hunting knife, David soon had the plug removed and a moment later drew forth a sheath of thin bark, carefully rolled so as to fit into the flask.

He now gave full reign to his curiosity. Supper was forgotten. The Malays ate without him. They could not understand why anyone should want an old thermos bottle more than a good cooked supper after a weary day's journey up the river.

With fingers trembling with excitement, David unrolled the curious script and peered into its contents. The singular appearance of it had fired

WE humans give our small neighbors the ants credit for too little intelligence. We watch their amazingly efficient activity and comment on it as mere "instinct." Yet a great many competent students of ant life say that it is a reasoning intelligence rather than instinct that allows the ant to conquer his environment in the astonishing manner that he has.

Ants are really clever creatures, and it is possible, as our author pictures, for them to build up great cities, and make slaves of animals that despise them. Suppose, for example, ants could make slaves of us and have us do their work for them? As our readers can realize, this is a most intriguing idea, and Jim Vanny has used it here to work out a corking adventure story.

his curiosity and he could hardly wait to see what mystery it might hold. Why had it been placed within this thermos flask and cast to the care of the waters of the Tanum? David carefully spread it before the camp fire.

The Manuscript

IT is the 18th day of April, 1945, (the manuscript ran) as I sit in my prison and pen this chronicle of my experiences since January, 1944. After months of captivity, I have at last formulated a plan by which I soon hope to escape from this city of horrors. At least I believe I shall soon be safe again. If God wills, I shall leave behind forever this terrible place. Through careful secrecy I am able to prepare this manuscript. Should they discover either the manuscript or my plans to escape, I should be put to instant death. So before making my attempt, I shall cast it, sealed in this thermos flask, over the river wall. Then should I fail to escape or be unable to reach civilization after leaving here, may this reach the proper hands. For the world must know of this terrible menace. Also I want my little Lureen provided for. Thank God I have enough to leave to her so that she shall not want anything. And should I never see her again, I want her to know that my last thoughts were of her. How she must have suffered from the uncertainty of the last year!

My name is John McConnell, of London. I am a professor of biology and a member of the staff of the British Museum.

On January 30, 1944, I was granted funds by the British Museum with which to organize an expedition to the Malay Peninsula to make a study of some curious biological phenomena to be found there. World progress has little changed these jungles—they remain the same as they have been for innumerable ages. When Charles Darwin called the Malay Peninsula the "Topsy Turvy Land," little did he realize the full significance of his statement. But I must get to my story. At any moment I may be discovered and then all would be lost.

I selected five other men to accompany me on this expedition. The world will undoubtedly recall these gallant sons of science, namely: Lemuel Corson, Geologist; John C. Kroll, Zoologist; James Earl Addison, Interpreter; Henry E. Longsworth, Botanist; Jess Lynch, Photographer.

We worked with great haste and two months after funds had been granted for the expedition, we found ourselves in the midst of the tropical jungle.

I have forgotten those first days in the Malay jungle. Our party consisted of three dugouts, six white men, and nine Malay "boys" for guides, cooks, and general assistants. For two days we passed up the waters of a sluggish stream, taking photographs, collecting specimens of the insect life and the flora of this section and noting the general data. We were in our glory. I have never known happier moments in my life. The only cloud on the landscape was the fact that my daughter, Lureen, could not be with me. But this is no place for a white woman. There are a few here, to be sure, but it is a hard life for them.

On the third day out we made camp near a small village on the Tanum River. After supper had been finished, our Malays wandered off to the village and left us six white men alone to discuss events together. We had been sitting about the camp fire for about an hour when an old Malay returned with three of our "boys." He seemed greatly excited over the fact that we intended to penetrate farther into the interior toward *Gunong Tahun*, which is Malay for "Forbidden Mountain." It seems that only a few hours before our arrival, the village had been raided by a giant white ant (according to its inhabitants) and some of their children carried off. So they were holding a great religious ceremony that these evil ones might not return.

I have heard many of the superstitious tales of the Malay, but never anything like this. My interest was aroused as was the other members of the expedition, and we bade the old fellow join our circle and tell his story.

CHAPTER II

Omar's Story

(as interpreted by Addison)

LONG ago," began old Omar, "there came to this jungle a large, white ant. From the beginning he was an aggressor and soon established himself monarch in the country about the headwaters of the Tanum. He would attack other ant villages and carry off the young to be brought up in slavery in the city of the white ant.

"The city of the white ant was built both underground and above, the excavated portion being used for storage and the growth of fungus upon which the white ant lived almost entirely. The upper part of the city was constructed of boughs and leaves gathered from the surrounding forest.

"As time went on, this ant evolved from an insect of about two or three inches in length to an enormous creature some three or four feet from tip to tip. But his smaller prey did not increase in size like the great white ant. Yet, as the ant city grew, the need for slaves increased—slaves who could do the work that the smaller ants could no longer do. So one day a squad of white ants raided a Malay village and carried off many children. The Malays were frightened but furious. A searching party was at once organized and sent in search for the missing children. Only one member of the party returned, his body covered with savage bites and his system racked with poison. Before he died he told an unbelievable story of a city of giant ants, many miles up the river.

"In all the jungle the great white ant became feared —by all but one. He was the driver ant, who, in spite of his relative smallness, was feared by the giant slave hunters. Through generations of slavery the white ant had become a rather lazy, inactive creature. The driver on the other hand, was an industrious, active insect.

"Since that first invasion of the Malay village, many others have occured. Other villages have been raided and the natives of the interior live in constant fear of this terrible ant. Surely he must be some god and if the proper sacrifices are offered, he will in time be appeased."

* * * * *

As David reached the end of Omar's story, he stirred the dying embers of the camp fire and called to Tok for more wood. The fire replenished, he turned once more to the fascinating manuscript under the light of the brightening blaze.

* * * * *

Omar's interesting story (the manuscript went on) caused much jovial comment on the part of the six members of the British Museum Expedition.

"Ants," scoffed Corson, digging his boot heel into the soil. "More likely the poor devils were carried off by a tiger."

"If they were carried off at all," returned Lynch.

"Righto!" It was Addison talking now. "You know the Malay is as rich in tales of folklore as any race in the world."

We agreed that Omar's tale was a most extraordinary one; and with laughing good-nights, we turned in shortly thereafter, the tale of the aggressive ant forgotten.

The following day we pushed on up the Tanum which seemed to grow narrower at every yard of travel, losing itself in the tangle of tropical jungle.

We pushed on upstream for another day until at noon of the second day our boats scraped bottom. By building a lock, the "boys" were able to go farther up the shallow stream. Then we built three or four locks that afternoon, dragged the boats over low waterfalls by using jungle creepers for ropes, until sundown forced us to again make camp on the river bank.

It is strange that our Malays had never heard the story of the giant ants, but they came from the more populated district far below the superstitious jungle villages and being less religious than the people of the interior, were less influenced by their fantastic tales.

Slowly we made camp for we were tired from a more than usually strenuous day. Monkeys abounded on all sides; and we were never wanting for fresh fish, for the Malays were excellent fishermen with their spears. After supper I conferred with Saru, my head man, and found that we were only a day's march from the source of the Tanum River. Here we would have to abandon the boats and go on afoot toward *Gunong Tahun*. Then, weary and tired, I turned in.

The Attack

IT must have been along toward midnight when I was awakened by a strange murmuring sound that I could not place. I lifted myself on one elbow so that I might better catch the sound. All about the camp there appeared a dull, phosphorescent glow as if many giant pairs of eyes circled us. Tigers! I reached slowly to my side and grasped my rifle. With caution, although I felt that every move was being watched, I aroused the camp.

Two of us were armed with heavy repeating rifles. The others gripped the handles of .45 calibre automatics. Saru threw more wood on the dully glowing campfire. It blazed up. The eyes advanced from the shadows of the forest. But even as they did so, our blood froze with horror. For not the lean body of the tiger followed them. A tangle of spindly legs—a long, white body!

"Omar's white ants!" yelled Longworth hysterically, and simultaneously his automatic shattered the solemn silence of the jungle. We followed suit. As the staccato of shots died down, a half dozen of the ugly insects lay on the ground convulsing in their last earthly struggle.

But we could never load and fire fast enough to check the advance of that onrushing insect horde. We fought wildly, grasped our rifles by their barrels and beat at the invaders with the butts. But with no avail. Their strength was appalling. I heard the terrified screeching of the Malays. I saw my comrades go down, felt myself going—and a merciful blackness spared me further agony.

* * * * *

David shuddered as he turned the next page of the manuscript and glanced apprehensively about the deep shadows of the jungle. He threw more wood on the fire and again turned to his reading.

* * * * *

When I again came to my senses I found myself in a very peculiar prison. It was built up of logs from the surrounding forest and the interior greatly resembled a log cabin except that there were no windows. A small doorway about four feet square was sealed tightly with a log door. The floor and ceiling were also of logs fitted tightly together.

From without came a curious low hum of teeming insect life. I listened intently but could make out nothing distinctly. Then I examined myself from head to foot.

I was none the worse for my experience. My clothes had been torn to tatters, a two quart thermos flask which I usually carried strapped to my belt was still there. I remembered that I was so tired that its empty weight had been forgotten and I must have lain down to sleep without removing it. The only other article that remained on me was a short pencil in one of my shirt pockets. With no clear idea in mind I removed the flask, placed the pencil inside it and concealed them under a pile of straw which lay in one corner of my prison.

Shortly thereafter the sound of footsteps outside the door arrested my attention and a moment later my door swung in and a native Malay entered with food. I attempted to converse with him but he would say nothing. I spoke a few words of Malay with no better success.

He left the food and went away again. It consisted of a drink of sparkling water and a durian. Unused to this famous Malay fruit, I could eat but little, for, although regarded by the Malays as a rare delicacy, to me it was like attempting to eat a very bad egg. It certainly smelled as such. The water was very fine, however, and after washing down what little of the foul food I had been able to partake, I felt somewhat better and eager to learn more of this strange colony into which I had been made a prisoner.

I was not kept in my prison long. Through the Malays I was told that there was no use attempting to escape. I was therefore divested of my tattered clothes, dressed in a *sarong* and made to consider myself a slave of the great white ant.

This ant city is built in a circle like an ant hill, except that the "hill" is constructed of wood and contains living

quarters and various chambers. Through my weeks of slavery I have never allowed an opportunity to escape in which I might learn something about these amzing creatures. This species of ant is greatly like the tropic ant known to scientists as the *Oecophylla smaragdina*, which forms leaf nests fastened together by silks. The ant, in my opinion, is a direct descendent of this little tropical cousin. The ant of this city, however, has in the course of evolution, acquired the diclosis or slavery trait. Just how it has been acquired, I am not prepared to state. It greatly parallels the European *Formica sanguinea*, who raids the nests of other species and carries off the *pupae*, from which workers subsequently develop.

"If We Make It."

THAT these creatures are ants there can be no doubt. They are at once recognized by their elbowed antennae, and conspicuous "waist" formed by the constriction of the abdomen where it unites with the thorax. There are no wings.

The ants appear to have no outward means of conversation. When they they touch their antennae, their thought travels from one to the other and there is no necessity of any words. I do not know if they can read the human mind. It is obvious that they have some way of conveying their demands to their native slaves, for the Malays all seem to know what is required of them.

I have no idea where the others of our expedition were carried to. I do not even know if they survived. And I have no way of finding out. These ants live chiefly on fungus growth which they cultivate themselves in underground chambers or "gardens." It is in one of these chambers that I have been put to work.

For days now I have been planning an escape. Saru, the Malay "boy" who I mentioned before, has just been put to work in the same chamber as I. There is a flume or rather underground tunnel which enters this chamber conveying water to the fungus chambers. It was evidently dug by the ants from some stream or river outside the city. There is a gate at this end and I am sure one at the other end for the water may be stopped flowing when the chamber gate is open. I have mentioned this sluice to Saru and he is willing to attempt an escape through it with me. How far it reaches or where it comes out I have no idea. Perhaps that is why others have not tried to escape through it. But Saru agrees with me that anything would be better than a life of slavery under the white ant.

I only wish I knew the fate of the other members of the expedition. Saru says that many of the Malays were killed resisting the ants. That makes me shudder. For we white men certainly resisted the attack.

By constantly peeling the bark off the logs of my prison room (which I am using to write this manuscript) I have made an opening large enough to slip my thermos flask through. I can just see water when I peer through and I believe it is the source of the Tanum River. I must take a chance. Perhaps if luck is with us we can escape and bring succor to our unfortunate companions, if indeed they are yet alive. If Saru and I do not make it, it may fall to the lot of this thermos flask to do so. It is almost time for me to return to the fungus chamber so I must stop writing. Until we meet again—Farewell!

CHAPTER III

A Meeting in the Jungle

THUS the absorbing manuscript came to a close. The camp fire had again died down to a heap of glowing coals. The Malays all lay sprawled about, sleeping. Their worries were not many. They had had a good supper and there was nothing for them to do but sleep until the morrow.

For a long time David sat and smoked his pipe in the brooding silence of the jungle. There was many things he wanted to ask Tok, but he, too, lay sleeping with the others. At length David knocked the cold ashes from his pipe and followed their example.

After the engineer and his Malays had breakfasted the next morning, David called Tok to him.

"Tok," he asked, "have you ever heard of a legend of a great white ant?"

The Malay thought for a moment.

"I have heard of such a story, *tuan*," he replied in his native tongue. "But I have never heard it told. We Malays do not believe all the stories that come from the interior. You see, *tuan*, many of them originate with the Orang Utans. (Jungle Men)."

Tok carefully questioned the others but they likewise were ignorant of the curious insect. So David derived from the information that the ant city, if such existed, must lay near the base of *Gunong Tahun*, the Forbidden Mountain.

David had several times pondered upon the possibility of a hoax, and had it not been for the fact that the disappearance of the McConnell Expedition had been the talk of England some months previous, he would undoubtedly have forgotten the strange manuscript and gone on with his surveying. But after careful consideration, he decided that there might be something to it. So after coming to the conclusion that the manuscript should be placed in the hands of the authorities without delay, he dispatched two Malays on a return journey to Singapore, where they were to turn the script over to the British authorities.

From here David went on with the search. A week passed but they found nothing. Time passed quickly. Too quickly, David thought. He had practically abandoned all the survey work and had devoted himself in earnest to the task of locating some clue that would give a foundation to the amazing manuscript.

It was early afternoon on their fifteenth day in the jungle. They were traveling through a dense forest of bamboo by the way of an old elephant track. It had been worn to a deep rut from generations of elephant traffic.

Suddenly Tok who was in the lead halted and held up a hand in warning.

"Diam!" he whispered, which in Malay means "Be quiet."

Cautiously he disappeared around a turn in the trail. For five minutes we waited, then he returned as silently as he had gone.

"It is another party, *tuan*," he informed David

quietly.

"Another party?" David repeated in some surprise. "Who is it?"

"They are camped just ahead, *tuan*. There are only four people in it. Two Malay boys, and a white man and woman."

"A white woman!" exclaimed the engineer. "What nonsense is this—?"

"A white woman, *tuan*," insisted Tok firmly.

"Good Lord!" cried David. "What can a white woman be doing in this God-forsaken country?"

Then turning to Tok. "How old is she?"

"She is young," replied the Malay.

"And the white man?"

"He is not young, yet he is not so old."

"I see. Let us go on."

It was indeed a surprise but when the party ahead found it was friends, they were more than glad to welcome the engineer and his Malays.

"How good it seems to see a white man!" cried the girl. Her companion laughed. He was a monocled Englishman with a small, sandy mustache and cold blue eyes.

"Not so complimentary for me, wot?" he suggested.

"Oh now, Robert," said the girl in a soothing tone. "Don't take it that way. You know I should never have gotten along in this frightful wilderness without you."

"All right, Lury," he replied. "But perhaps we had best introduce ourselves."

"That goes for myself," put in David. "I am David Marsden, of London, surveying for a government railroad."

"This is Sir Robert Darcy," the fair haired girl introduced her companion who bowed politely to the young engineer. "And I," she went on, "am Miss Lureen McConnell of London—"

"Lureen McConnell!" grasped David hardly believing his ears. "Are you related—that is—do you know Professor John McConnell—"

"Yes, yes," the girl's eyes were shining with a new interest now. "He is my father. Do you know him—"

"For God's sake, man!" cried Sir Robert stepping to David's side. "If you know where Professor McConnell is don't keep us in suspense!"

DAVID shook his head. "No, I don't know. But I have a very strange story to tell you. If you will sit down—it is rather long."

"Of course. I beg your pardon," replied Lureen. "In my excitement I quite forgot."

"As I told you," began David, "my reason for entering the jungle was to survey the route of a proposed railroad for the British government. . . ."

The girl hung on to every word he said. Through the entire course of the story she never interrupted once. And when David had finished she sat for several minutes in silence.

"I believe we shall find Daddy," she said earnestly. "I've always hoped and prayed that he would some day return. But the suspense of waiting was too much. So I insisted that Sir Robert assist me in searching for him. We came to the Peninsula ourselves, got these Malays to guide us, and came into the jungle. You see, we thought it would be wiser than to bring a large party of inexperienced persons into the wilderness."

"You were very wise," David assured her. "But now that we have met, I believe it would be wise to organize a plan of search. That is—if you care to have my assistance."

"Why—of course. It is really more than I had expected. You see—"

"Yes, I understand," broke in David. "But the interests of science and humanity come foremost with the government. They would insist that I abandon my present work and follow up the clue furnished by the manuscript. So my 'boys' and myself are at your disposal, Miss McConnell."

The girl smiled in sincere appreciation.

"That is so good of you, Mr. Marsden," she replied. "But please do not insist on being so formal in the forest. I should feel much easier if you would just call me Lury."

The engineer chuckled softly.

"Certainly. And all my friends call me Dave."

It was the girl's turn to laugh.

"All right—Dave."

"And when addressing me," chimed in Sir Robert, "kindly make it Darcy.

"You see," he explained, "we get so much formalities, we are glad to get away from them for a little while. Lury and I are engaged to be married and we've been attending so many formal teas, dinners, parties and what nots that we've become rather bored with it all."

"Oh—I see." There was a note in David's voice that he did not understand and he wondered why the girl turned away and appeared occupied at something else when Sir Robert spoke of their engagement.

But David's manner did not betray his sudden interest in Lureen McConnell. Instead he went on making plans with his two new found friends for the rescue of the girl's father. The girl did most of the talking for herself and Robert while the Englishman sat and languidly puffed on an Egyptian cigarette.

On the following morning the two search parties went on as one. On acount of the small number of them it was deemed wiser and safer to continue thus. Farther and farther into the interior they penetrated until at length they came to the slopes of *Gunong Tahun*. The clatter of birds and numerous chattering monkeys were the only means of breaking the monotony of the primeval forest. And once an elephant passed nearby, but was soon lost in the dense wooded fastness.

"This is the neighborhood—" began David. The girl shook her head in understanding. Then looking up the wooded slopes of *Gunong Tahun* she asked: "Can this be it?"

David turned to Tok with a question. Then he turned once more to Lureen.

"Tok says this is the mountain your father mentioned in his manuscript," he assured her.

"Then we must be near the ant city," the girl ventured softly. "Oh, where is it?"

"We can't be sure," replied David. "You must remember we are in a vast expanse of jungle. The city will be but a mere speck in its vastness."

"You will remember also," he continued, "that it was

at the base of this mountain that Professor McConnell and his expedition camped. We must not follow his example. I propose to ascend this mountain from which we can get an excellent view of the surrounding forest. Perhaps we can even locate the ant city from its heights."

"An excellent idea," was Darcy's opinion.

For half a day they toiled up the steep slopes of the forbidden mountain. Gradually, through breaks in the vegetation, they could see the panorama below them begin to unfold. Then, about an hour before sunset, they came out upon a high point not far from the mountain's summit and saw spread below them the wild maze of the tropic jungle. It seemed to lie in an unbroken blanket as far as the eye could reach. But after piercing the distance with a pair of powerful binoculars, Sir Robert Darcy turned to David.

"Tell me what you see off to the southeast," he said handing them to the engineer.

David looked. "The ant city!" he cried a moment later.

On to the City!

THE girl grasped the binoculars eagerly and peered through the powerful lenses. It twas as her father had described it in his manuscript. A round mound of logs and materials that had been gathered from the surrounding forest. From their point of vantage they judged the thing to be a mile across with a wall some thirty feet in height all around it.

"The ant city," said Lureen again.

"Or an aboriginal village," suggested Robert. But David only shook his head.

"I don't believe you will find an aborginal village so far in the interior—or so near this mountain," he said.

"And to think we may be looking down upon my father's prison," murmured Lureen softly.

"We shall soon know," David assured her.

"How?" was the girl's eager question.

"We will camp on the mountain to-night," replied David. "No camp fires—we must take every precaution. After dark I shall reconnoiter a bit. I can easily slip through the forest—I shall take Tok with me. Perhaps we can learn something of this queer city in the jungle. We shall try—"

"But Dave," there was an anxious note in Lureen's voice. "There is danger. You may be captured—or killed. Isn't it best we all go—together?"

The engineer shook his head. "Tok and I must first get the lay of the land. The whole party would be taking too great a risk."

With reluctance the girl gave in. Darcy made no comment. He probably felt that David would have his own way eventually in spite of all protests.

After a cold supper, Tok and David prepared for their trip. They took only bare necessities including water and ammunition for David's automatic. Tok's arms consisted of a good stout club.

At nine o'clock they slipped noiselessly away from camp. They had determined that the city lay not less than five miles away from their camp on the mountain and therefore they must make haste. They did not expect to return before daylight.

"If I do not return by noon tomorrow," David told Lureen and Robert at parting, "it is best you and your boys go on over the mountain for help at the island of Penang which lies not more than seventy-five miles beyond."

The girl nodded, but from the expression on her face, David felt that she would do no such a thing. She would in all probability follow him and Tok. He said no more. But in his mind he formed a firm resolve to come back.

Tok led the way down the mountain. It was a precarious route made more so by the darkness. They covered three miles with no mishap, although they knew that the danger which lurked on every side was closer as they drew nearer the forbidden city. It was past midnight and the silence of the jungle night was appalling.

Nearer and nearer the Malay and the engineer approached the city. Greater grew the danger of detection. But they kept steadily on. Presently Tok halted and pointed through the trees.

"Look!" he whispered in the white man's ear.

Almost at their feet ran a yellow, sluggish stream that appeared black and forbidding under the cloak of night. It was about ten feet wide and directly across on its opposite bank ran a clearing some fifty feet in width. It terminated in an abrupt wall. The ant city, without a doubt!

Tok clutched the heavy club he carried. David nervously fingered his automatic revolver. And as they stood there uncertain of their next move, the black's form stiffened and he again drew David's attention, this time to the top of the wall.

There, plainly outlined against the sky, stood a giant white ant!

CHAPTER IV

Breathless Moments

FOR a minute the thing stood perched thus as if trying to determine something, uncertain of its next move. Then it came swiftly down the perpendicular wall and headed toward the stream. With a single bound the thing had cleared the ribbon of water and was making for the brush where the two spies lay concealed.

"Quick, Tok! Your club!" whispered David sharply.

The Malay swung at the giant insect with all his strength. With a quick move as he came on, the ant sidestepped the blow and darted toward the Malay. David had no choice. He threw his revolver to his hip and fired.

As the echo of the deafening report died in the jungle, other ants suddenly began to pour over the wall of the city. Then suddenly from somewhere up in the wall came a human's voice.

"Help! Whoever you are, do not leave me—Help! Help! Help!"

"Who are you?" called out David.

"John McConnell of London. I—"

"We are outnumbered!" David shouted back. "We must run! But we will return. Don't give up hope. We will be back!" And with these parting words he followed Tok back into the jungle.

The two men fled blindly. They had the advantage of a slight start, but from somewhere behind they could hear the low drum of many feet moving swiftly through the brush. They knew that their hideous enemies were in hot pursuit.

They ran in a half circle, heading back toward the stream considerably below the ant city. It seemed they must soon give up. The pursuers were closing in. Both men were nearing exhaustion from their rapid flight. Then suddenly there was a splash and they stumbled into the water. Quickly recovering, they found it to be not over a foot deep.

"Quick!" cried Tok grasping David by the arm.

With haste the two plunged downstream. One hundred feet, two hundred feet—on and on they went. Perhaps it would serve to throw the insects off their trail. Yet at any moment they expected to see the pursuing horde loom upon either bank and overwhelm them.

* * * * *

The morning light was breaking when David and Tok finally came to the foot of the mountain on whose slopes they had made camp the previous night. Their bodies were wet and tired, sore and burning from their hasty flight through the tearing, clawing brush. Even now they went on cautiously. No telling how far these creatures had spread their net to ensnare them.

It was nearly noon when they at last reached the site of their camp. Anxiously David peered ahead for some sign of greeting from those they had left behind. None came. But as David and the Malay broke through the tangle of brush and stood once more where their camp had been they started back in horror.

Scattered about in confusion was all that remained of the camp they had left in such perfect order the night before. The bodies of several of the Malays lay crumpled about the wrecked camp. They were terribly mutilated. And as David's eyes fell on one limp form, he sprang forward with a cry of mingled rage and sorrow. Sir Robert Darcy lay quite still, his cold hands still clutching the automatic rifle whose chamber was empty. The empty shells scattered on the ground about him gave mute testimony of his losing battle.

Both he and the dead Malays were bloated from the formic acid poisoning. Tok and David were sickened at the sight. What had happened to Lureen and the other Malays? It was not hard to guess their fates. The ants had discovered the camp before David and Tok returned.

With sorrow written on their faces and vengeance in their hearts, the engineer and the Malay guide buried the dead as best they could. David marked each grave with a crudely carved piece of wood from the jungle. And when his task was finished he stepped back.

"God!" he breathed in anguish. "What can we do? How will we find them? How will we save them?"

"Tok find them," replied the Malay with assurance.

David gave his head a little twist of determination

"We've got to find them, Tok," he said, gripping the Malay's hand.

David Again

WHEN the great white ants appeared suddenly from the surrounding jungle and attacked their camp, Sir Robert Darcy and the Malays fought with all the intensity that comes of despair. But as in the case of the British Museum Expedition, they were outnumbered beyond all hope.

Sir Robert emptied his automatic rifle into the maze of creatures before he was over whelmed and felt their terrible jaws sink into his body. Then a merciful blackness overtook him and he passed beyond the realm of mankind.

The Malays were putting up a losing fight with clubs of firewood while Lureen stood transfixed at the sight of the terrible thing that had overcome Sir Robert.

The defenders were soon beaten down, killed, or carried off into the enveloping blackness of the jungle. Such was the fate of Lureen. Sharp pincers pierced her soft skin as one of the hideous things carried her along in its mouth. She was covered with saliva from its dripping jaws and she shuddered in horror as she was borne away. To what fate? Must she become a slave of these overgrown insects? Must she toil for the remainder of her life in the fungus beds of the white ant? Then she thought of her father and wondered if he had escaped as planned. She longed to see him, but not in the power of these awful creatures. She hoped that he should never see her in such suffering, nor she him.

Then she thought of David. What had been his fate? And Tok? Good, faithful Tok. Had they too fallen prey to the ants? Or had they, by some miraculous chance, been spared this fate? Somehow she felt that David had escaped the creatures. And she knew he would soon rescue her. And in her thoughts of him she found comfort.

The ants moved swiftly through the jungle. And long before dawn had unfolded the mantle of night, Lureen saw looming walls before her and knew that she had come at last to the ant world.

There were no portals to be opened; no gates to be guarded. Quickly the insects mounted the perpendicular wall, clambered into an entrance high above the ground and Lureen found herself in pitch darkness. She knew these ants could see their ways about. But she was utterly helpless in the stygian gloom.

Presently she felt the grip on her relax and she dropped suddenly to a bed of dried brush or straw. She heard retreating footsteps and she knew that she was alone. Her first impulse was to get up and run—anywhere—but her cooler sense told her that her captors had foreseen this. She was a prisoner, and a prisoner she would stay

And so, tired from the previous day's travel, weary from the terrible events of the night, and with the bronzed face of a young civil engineer haunting her dreams, Lureen McConnell slept fitfully through the dark hours before dawn.

When Lureen awoke she gazed about her in a rather dazed condition. Slowly the events of the night previous came back to her.

The sun had been up for some time. She arose and examined her prison. It was similar to that described by her father in his manuscript. She wondered what fate these creatures had in store for her and as she recalled the previous night's experience, sheshuddered.

A native Malay brought her food as he had done Professor McConnell, but the girl was able only to drink the clear water. Then she sank limply into the pile of straw and tried to think. Was there no possible means of escape from this dreadful city? As she pondered the door of her prison swung slowly open and Lureen sprang to her feet with a stifled cry of joy as David entered the room.

"Shhh—" he cautioned. "Quick! We must get out of here."

Obediently she followed him. They passed from the log room to the passage outside and quickly along its dark interior. The girl wondered at the absence of the creatures she thought would infest the place.

In the Flume

PRESENTLY they entered a chamber that was a great garden of fungus.

"But how did you ever gain entrance to the city?" asked Lureen of David.

"Tok and I got back to camp at noon yesterday and found your raided camp," he explained quickly. "We needed no one to tell us what had happened. We have been scouting this city ever since. Our chance came about an hour ago. Some white ants returned from the forest on the run and when they got to the others great excitement prevailed. I don't know what it is but I've a hunch—"

"What is it?" asked the girl eagerly.

"Driver ants! The white ants are making great preparations for the defense of the city. You remember your father said they feared none but the drivers."

"Yes. And Daddy—where is he—"

"Safe," replied David shortly. "Hiding in the flume the ants use to bring water in from the river to their gardens. During the excitement, Tok and I dammed the upper end of the flume and entered the city by it. Your dad and Tok are there now with a few other Malay boys we rescued from the city. Come."

Lureen asked no more questions. She followed David to the entrance of the flume where a man whose careworn features and gray hair made him look old, waited for them. And as Lureen saw him she flew into his arms.

"Daddy!"

"Lureen! Yes, it is my own little Lureen."

They embraced. Then David reminded them of their situation and all three retreated into the flume. Tok was there and his joy at Lureen's rescue was evident. And then the girl turned once more to David.

"And—what about—Sir Robert?" she asked haltingly.

David turned his head away. The girl laid a reassuring hand on his arm.

"I—understand," she said softly, in genuine sympathy. There was no trace of grief in her voice.

"Sir Robert died like the gallant gentleman he was." David reassured her when he found his voice. "We found him still clutching his rifle."

"Poor Robert," murmured the girl.

Her father reached out and took her hand.

"Perhaps it is better this way," he said to her. "But through five years of misfortune I have realized what an old fool I had been in insisting on such a match. Had Robert lived, Lureen, I want you to know that I would have released you from your pledge."

"Dear, dear Daddy," were her only words.

"You—" began David; but Tok broke in.

"We must get this entrance barred, *tuan*," he said. "At any moment we may be discovered."

Together they swung closed the great trap door that sealed the passage.

"Let us hope it withstands the attack," said David desperately.

"It must," were Professor McConnell's grim words. "If the driver ants ever get through—well, nothing can stand before them."

"But haven't the white ants repulsed similar attacks?" asked David.

"Yes. But I hope that they will not withstand this one. Each attack has been stronger and each time it has caught the white ant lazier and weaker. These white ants have developed, it is true, to a high state of intelligence. But they have lost much through the institution of slavery. It has weakened them as a race—made them less hardy. You see—"

David nodded.

"If the white ants win the battle we stand little chance of ever getting out of here," David said. "If the driver wins, I understand he will go on away leaving the city devastated."

"That is true," replied the professor. "Let us wish the best of luck to the driver ant," and he chuckled in spite of the hardships he had passed through.

The War of the Ants

AN hour sped by. Then suddenly from without, came a cry in Malay. Tok turned to the others.

"They are coming," he said simply.

In the inky blackness of the flume they could see nothing except when David used his flashlight. He was sparing with this for he did not know how long the fugitives would have to stay in the tunnel. He had sealed the lower end so that they would get enough fresh air while they were thus hidden.

And now from outside came sounds of great activity. Then came sounds of confusion, noises of combat, the yells of Malay slaves. The city trembled under the tramp of many feet and those within the flume knew that the driver ant had launched his attack. The battle was on in all its deadly intensity.

"God, if they should break through!" murmured the professor.

"They won't," David assured him as they listened.

For an hour the batle raged in fury.

"Will they ever finish?" asked the girl. "Oh, it is so horrible!"

But no one answered. For at that moment there came the sound of a terrific explosion. The earth shook and portions of the ceiling of the flume fell on the fugitives within.

"What was that?" cried Professor McConnell alarmed.

"That was a man-made explosion!" cried David excitely.

"Man-made?" came Lureen's voice. "What do you

mean?"

"I don't want to raise false hopes," continued the young engineer breathlessly, "but I believe the government has answered your manuscript, professor."

Another deafening explosion followed.

"We can't stay in here much longer," David said, flashing his light about to note the damage. "We don't want the walls to fall in on us."

From outside came the staccato bark of a machine gun. The sound of scurrying insect life was rapidly dying out. Several more explosions followed the intermittant barking of the machine gun. Then a voice with a broad English accent hailed the city.

"'ello! Anybody 'ome?"

David waited to hear no more. Calling to Tok he turned his attention to the barred doorway. In another minute it was swung open and the little party emerged from the dripping, stuffy interior.

And the sight of a detachment of Britain's soldiers poking about the ruins of the shattered ant city was never more welcome to David and his companions.

They stayed only long enough to completely search the defeated insect world. But there were no traces of the five men who had accompanied Professor McConnell on the expedition five years before. Sadly they turned away from the strange city, yet with hearts thankful that they had been spared the fate that had overtaken the others.

* * * * *

The sun had dropped behind the forest top when they made camp once more on the banks of the lower Tanum, and the twilight that overspread the jungle seemed to breathe of peace. And when the twilight had faded into night it was not long before a crescent moon rose over the tree tops across the river and filled the cloudless sky and surrounding country with its silvery sheen. They sat upon the river bank, Lureen and David, while the warm breeze whispered softly across the river and blew the golden curls from her forehead. Her hands were in David's and as they looked out upon the bright path thrown across the river by the moon, it seemed that they were in a fairy world; the old one was forgotten. And they were content to let it be so for the present. The clouds of yesterday were gone and they built only castles in the dream world of tomorrow.

THE END.

What Is Your Knowledge

1—What is the meaning of "diclosis" with reference to ants? (Page 144)

2—What is it that kills in the case of a severe burn? (Page 137)

3—What is the "suppressed desire" theory? (Page 138)

4—What is the meaning of Mars being in opposition to the earth? (Page 119)

5—What is supposed to be responsible for the complicated social system of the ants and bees? (Page 121)

6—What is the effect on a body when it travels at an immense speed, according to the Lorentz-Fitzgerald formula? (Page 104)

7—What peculiar properties have radio-active materials when they start exploring? (Page 109)

8—What are herbivora? Saurians? (Page 153)

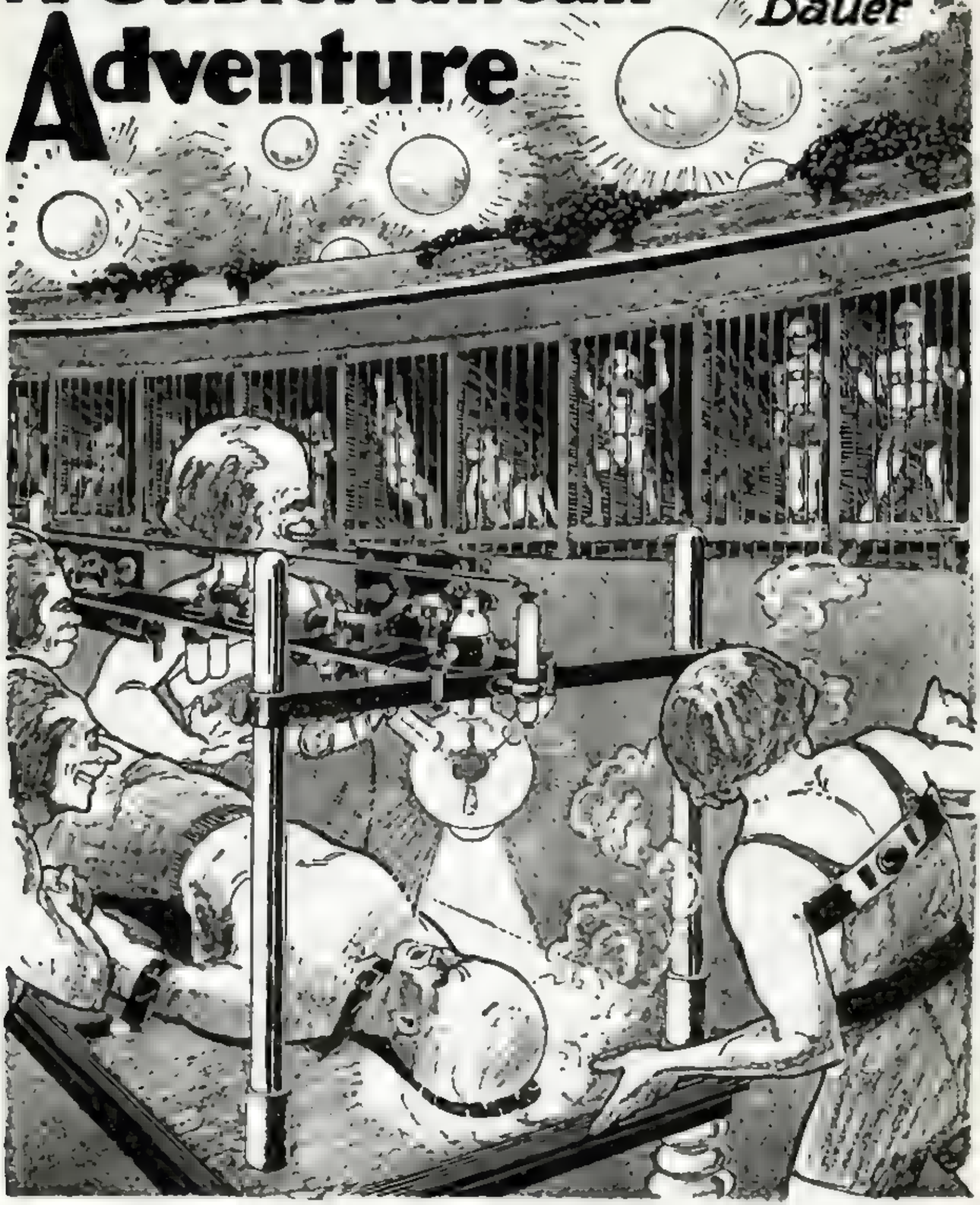
ANNOUNCEMENT

Due to the great avalanche of replies to the Slogan Contests an announcement of the results has been deferred to the August issue of WONDER STORIES.

—The Publishers.

A Subterranean Adventure

By George Paul Bauer



(Illustration by Paul)

Agam Servo laughed in our direction. Utterly appalled we watched, hoping that death had come to end the condemned man's tortures.

What Has Gone Before

Several young men driving along a mountain road near Denver, Colorado, come upon a strangely dressed man lying unconscious on the road. They take him to a hospital and on his recovery he tells the story of his disaster. He is an inventor, named Ned Gothrom, and together with his nephew Ted Cranston, attempted to bore a tunnel clear through the earth with a machine they called the Penetrator. After going down a number of miles the machine took a sharp fall and landed into a great sea of oil which formed part of a gigantic subterranean cavern. They reach the shore and finally find a great city in a valley below them. They are attacked by winged human-like creatures and taken to the city where they are brought before the governor called Taman the Thrice Wise. By means of a Sonoa, an instrument put on their heads, they are able to converse telepathically. Taman tells them that they can never return to the surface world. They are taken to a house of confinement. On the way they pass a beautiful young woman whom Teddy falls in love with. The mysterious girl comes to visit them but a winged man tries to force her to leave. Teddy vanquishes him and he leaves after making a threat against Teddy. The girl reveals herself as Noama, granddaughter of Taman, and the man as Sarro, Minister of Police, whom she has refused to marry.

BOTH Teddy and I were very much disappointed by Noama's announcement, and for several moments we were silent.

"But I am quite forgetting the object of my impromptu visit." Our guest interrupted the silence laughingly. "I am very curious to learn how you people came into our land, and what your intentions are. I questioned my grandfather about you; but, beyond stating that both of you are from the surface world, he declined to give me any further information. I have broken the prison rules by coming here, but I just could not resist the temptation."

Aided by occasional promptings from me Teddy eagerly undertook the task of acquainting Noama with the story of our adventure up to the time when we had first met her at the great white pyramid. With deepest interest and eager, shining eyes she listened intently, and when my nephew had finished, she applauded both of us cordially.

GEORGE PAUL BAUER

"What an extraordinary, wonderful idea it was!" she complimented me sincerely. Then her face saddened. "Too bad that you will not be able to carry it out now, even if it were not for the central ocean."

"But say, Noama, is that central ocean in any way connected with the oceans on the surface?" Teddy inquired. "And how big is it anyway?"

THIS story is now approaching its most thrilling phases. Our two adventurous explorers into the earth's interior are due for some astounding experiences, such as few men have had. The story is gripping, because our author has such a vivid imagination, which he displays in his ability to picture strange worlds beneath the earth's surface.

But there is both humor and tragedy in the situation of our surface men and their attempts to get out of the clutches of the Inner People. What is particularly interesting is the attitude of these sub-surface men to our own race. Whereas we pride ourselves on our achievements, on our civilization and believe ourselves to be the cream of the universe, the people of the Inner World see us as half civilized savages. A reading of this story then, might provoke a new point of view on ourselves.

The Walls Have Ears!

HIS eagerness to learn seemed to please the girl. She smiled.

"The central ocean is about two thousand of your miles across, and it has a surface too. But as to your first question—the central ocean is not now connected in any way with the oceans on the surface. But there was a time when it was indeed joined to the waters of the surface, so the records say. This was during the first earth, and the two moons, when our ancient ancestors, the Primarians, were still living upon the surface. Then came the great cataclysm, foretold by their council of wise men; and the people, at least part of them, emigrated down here to this land which their scientists had prepared for them. This happened about two millions of your years ago. It was during the great cataclysm then that the connections of the central ocean with the surface were sealed up forever."

"The first earth and the two moons—the great cataclysm—two millions of years ago—" Teddy mouthed rather idiotically. "Why, what do you mean, Noama? You are not joking?"

"Joking!" For just a moment Noama drew herself haughtily erect, and a quick gleam of anger shot from her eyes. Then, perceiving the amazement in Teddy's face, and no doubt in mine also, she realized her mistake, and relaxed. She laughed softly

"No, Tedde-e, I was not joking," she explained. "By 'first earth' I meant, of course, this same earth, as it was before the explosion of the sun burnt up about half of its diameter. That was the great cataclysm. The earth had two moons then, a larger and a smaller one. The present moon is the remains of the larger one — the smaller one was completely destroyed."

She pointed to a peculiar apparatus at the far side of the room.

"But you can get all that and more, visibly, from that electronic recording machine there. It will show you the high-points of the Primarian history."

"Yes—yes, Noama. But you mentioned something about two millions of years ago, when your ancestors came into this land," Teddy reminded her. "Two millions of years seems a good long time."

"Perhaps it seems a long time to you surface people," she said thoughtfully. "But we Inner People often forget that there is such a thing as time. We have in fact

no instruments for time-recording such as you people use to regulate your life by. We don't need such things. As you have seen, with us it is always day. We eat when we are hungry, we sleep when we are tired, and we work when there is work to do. But, to return to your question—it was, as I said, about two millions of your years ago when, in order to escape complete annihilation, the Primarians descended from the surface to this land; and have lived here ever since."

"Then there must be a way, a shaft or something like that, which leads to the surface," I said eagerly. "Do you know where it is, Noama?"

She gazed at me with sudden hostility, and I knew that she read the thought in my mind.

"Yes—I know where it is," she said slowly and reluctantly. "It is called 'the forbidden gate.' And the penalty for entering it is death!"

"Noama! Noama!" a great voice boomed suddenly through the room, causing the three of us to jump precipitately to our feet. I whirled about. There, from a large sphere of jet-like substance which stood upon a stone pedestal near the middle of the room, the awful visage of the governor of Raa, Taman the Thrice-Wise, stared out at us. But his angry, flaming eyes seemed directed to Noama only.

"Return to your quarters immediately!" he commanded harshly. "And remain there until I have word with you. Go!"

Almost immediately the vision disappeared. I was still staring in fascination at that magic black ball, when I heard Teddy's voice out in the hall. I swung about then and discovered that I was alone. A few moments later Teddy returned.

"She's gone," he announced with a doleful face. "Darn that old—!"

"Stop, Teddy!" I interrupted him sternly. "Remember that this room might have not only eyes, but ears as well."

CHAPTER IX

Two Million Years Ago

"WHAT do you say to experimenting with that 'electronic recording machine' as Noama called it, Uncle Ned?"

It was many hours later. We had taken a nap in the adjoining sleeping chamber, had eaten another lunch, and were now resting at our ease in the entertainment and study room. I was amusing myself with studying the hieroglyphic characters in one of the peculiar books of flexible metal, and Teddy was shadow boxing.

"Suits me." I agreed. "Maybe we can figure out how to run the thing."

Seen from the side, the apparatus in question was shaped like a capital P, with a very heavy leg. But from the front it resembled an upright piano, only that it was wider, higher, and more bulky. Two upholstered comfortable-looking chairs were placed immovably in front of it, above each of which, in the extreme outer curve of the upper part, two vertical, oval openings appeared, each of them framed by a raised and padded collar of metal. From each side of these collars a short, flexible arm jutted out, to the curved end of which a cone, similar to those of the *sonaa,* was attached. A single, somewhat larger, cone on a longer arm protruded about twelve inches below the lower edge of each collar.

About midway between the two oval openings was a dial the size of a dessert plate, which was divided into twelve sectors, and was surmounted by a movable hand, or indicator, attached to a round knob. Below this dial, in an easily accessible position from either side, were two large buttons, a black one and a white one.

We seated ourselves in the chairs, and immediately discovered that our faces fitted nicely into the raised and padded collars of the oval openings. We likewise found that the two upper cones fitted completely over our ears, and that the lower one was just right to fit snugly over our solar plexuses. The inference was quite plain.

"Do you remember what Noama said about this machine showing the high-points of Primarian history?" I said to Teddy. "Well, I have an idea that their history is divided into twelve parts, and that by setting the indicator hand on this dial we can get any part we want. Let's set it on the first sector, and see what happens."

"Fine!" Teddy agreed. "And the two buttons below the dial are the controls, I guess; the white one naturally for starting."

I quickly set the dial, and then he pressed down upon the white button.

* * * * *

Almost immediately a peculiar, greenish-golden luminosity began to grow before my eyes, and within this phenomenon of light, seemingly many miles away, I saw a small disc of greenish-white radiance. However, the luminous disc was obscured and rendered indistinct by a fog-like phenomenon, and I was speculating interestedly what it could possibly be, when the obscuring curtain of haze suddenly disappeared.

My first thought was that I was gazing at the moon during its maximum fullness. But quickly I realized that the luminous disc was not only much larger, but also brighter. But the most peculiar thing was that I seemed to be suspended somewhere in interplanetary space, and was gazing down at it from an immense distance.

Suddenly I seemed to be hurtling downwards at frightful speed. The luminous disc below me became rapidly larger and larger—resolved itself into a world of water, in the middle of which lay a great continent—And then, as suddenly as it had begun, the downward motion ceased, and to my amazement I found myself suspended above a vast, primal forest of gigantic, fantastically shaped trees.

But it was not a silent world this. For almost immediately my ears were filled with a medley of hideous sounds; an utterly ferocious and blood-curdling roaring and bellowing and screaming, which struck against my nerves like a searing pain. Far, far down in the dark abysses beneath the vast trees I could discern indistinct, moving shapes—

Then I seemed to be passing over the forest in a lateral direction and at very moderate speed, which enabled me to see everything quite clearly. Presently a large, swampy meadow appeared, at the edge of which I saw a horde of gigantic animals feeding peacefully

upon the luscious grasses and weeds.

The motion stopped, and my vision remained suspended just above the feeding monsters. With keen interest I noted that the flat, massive snout of each was armed with four slightly backwards curving horns, two large ones in front and two smaller ones back of them. Their heavy legs immediately reminded me of a rhinoceros, but their huge bodies were covered with long, and very coarse-appearing blackish hair. Suddenly the largest of their number elevated his enormous head high into the air, opened his great mouth, and sent forth a bellow like that of ten angry bulls in unison.

It was a challenge. And I was not long left in doubt as for whom it was intended. For almost instantly the gigantic challenger's furious bellow was answered by a not less vicious, defiant roar from the far side of the meadow. This vision shifted so that I could now perceive a second group of huge herbivora,* feeding at the opposite edge of the wide grassy space. The largest one stood a short distance apart, with his great head held proudly erect as he voiced the acceptance to the challenge—an immense elephantine creature with massive columnar legs, whose gigantic body was covered thickly with short, reddish-colored curly hair, and from whose lower jaw two ponderous inward-curving tusks protruded, the sharp points of which made them formidable weapons.

Several more times the two champions of the opposing herds exchanged thunderous bellows and roars of challenge and defiance. Then suddenly, as if at a given signal, they rushed towards each other with a speed that was positively amazing in creatures of their bulk; their ponderous bodies cutting through the deep grasses and weeds like the bows of battleships through the waves of the sea.

The End of the Battle

THEY met in the center of the meadow; and the crashing impact of their monstrous bodies sounded like the smashing to earth of a great tree. A battle of unspeakable ferocity followed. While the four-horned titan was endeavoring to rip open his adversary's belly with the sharp points of his horns, the other one was intent to drive his tusks into his enemy's neck and thus reach his heart.

They circled about each other, retreated, advanced and charged in never ending succession, and with ever-increasing fury, while their roars and bellowing caused the trees to tremble, and sounded in my ears like the rolling of near thunder. Blackish, thick blood soon spattered the grass all about them, and formed in ever-enlarging pools on the trampled, moist ground and crushed herbs. From both sides the two opposing herds now urged on their respective champions with a bedlam of roars and bellowings that was almost unbearable.

But presently I became aware of a new movement in the meadow, and soon perceived four or five immense shapes creeping up on the two fighters from as many directions. Frightful monsters they were, resembling lizards of gigantic size, their dark-green scales and beady eyes gleaming and glittering in the ruddy light of the sun. I recognized them immediately for what they were; carnivorous saurians,* armed with razor-like claws in their arm-like fore limbs and with dagger-like teeth in their heavy, cruel jaws.

Upon the approach of the gigantic saurians the two herds of herbivora had fled precipitately. But the two fighters, blind with battle and blood lust knew nothing of the dread presences until the sharp, cruel fangs of the saurians crushed down into their spines. But, spent from their battle and loss of blood as they were, their frantic resistance was unavailing, and with demoniac, throaty laughter, the saurians devoured them while they were still half alive.

I was greatly relieved indeed when the vision moved away from that scene of carnage and death. A large inland sea appeared now, at the swampy shores of which a number of great reptiles were visible. They were even larger than the carnivorous saurians of before. But evidently they were of the plant-eating kind, for they were peacefully feeding on the leaves of trees, and on the succulent grasses and weeds near the water's edge. Smaller saurians, apparently the young offspring of the larger ones, were feeding and gamboling half submerged at the shore.

It was while I was watching the antics of them that suddenly a pair of immense jaws shot out of the water close to them, caught one of the young saurians by the neck, and despite its frantic struggles pulled it out of sight beneath the water. For a few minutes the sea boiled and foamed as the battle continued beneath its surface. But quickly everything was quiet again; and the feeding and playing went on as if nothing had happened.

Presently I seemed to float over the tops of gigantic trees again, the upper terraces of which were alive with a multitude of smaller creatures, that climbed and crawled and flew, and filled the air with a thousand discordant cries and noises. The vision passed on, and a wide, grassy space came into view. The place was an almost circular valley; and as the view extended, I saw that in the distance it was surrounded by a system of peculiar, jagged mountains.

But quickly my attention was drawn to a number of immense creatures, whose bodies appeared a solid mass of great, bony shields, and whose backbone was a continuous chain of short, sharp horns, the size of which diminished gradually towards the ends of their long, flexible tails.

Skeletons and carcasses of many animals were scattered all over the valley, about the latter of which large swarms of great, bat-like creatures fluttered and flew, and fought viciously; their harsh, discordant cries filling the air with a frightful din, and their sharp-toothed jaws tearing huge chunks of putrid meat from the carcasses. Undoubtedly they were flying reptiles, of the order of pterodactyls, and I suddenly smiled to myself as I remembered Teddy's designation of them as "prehistoric fowls" during our travel on the *Penetrator*.

The vision remained stationary above this valley; and even while I was disgustedly watching the feeding of

* Animals that live on vegetation as contrasted with carnivorous or flesh-eating animals.

* A division of the reptile family referring to lizards, etc.

the noisy, bat-like saurians a peculiar haze was beginning to form itself before me, which quickly blotted out the scene below me. And with the disappearing of the vision, all noise pertaining to it ceased also.

CHAPTER X

The Grim Warning

I HAD a feeling that an immense period of time passed. Then presently the luminous haze began to thin again. It disappeared— And then I stared in utter, incredulous amazement at the magic change which had taken place in the valley below me.

There was not the least doubt that it was the same valley upon which I had gazed before the haze had blotted it from my view; a glance at the surrounding, peculiarly shaped jagged mountains assured me of that. But where before I had viewed a most primitive, grass-covered plain, peopled by prehistoric, nightmarish monsters, there appeared now before my incredulous gaze a great city of magnificent buildings, peopled by a multitude of busy humans!

Directly beneath me appeared a most beautifully arranged, circular park of magnificent trees, emerald-hued lawns, and marvelous flower beds of a thousand brilliant colors and shades. But almost immediately my attention was drawn magnet-like to an object in what I judged to be the exact center of the park. From my position it appeared to be a perfectly circular building of glistening white stone, or similar material, topped by a vast hemispherical dome of shining ruddy-golden metal, and encircled by a colonnade of graceful, close-set columns, to which a circular set of nine low and broad steps led.

Like spokes from the hub of a titanic wheel, sixteen wide, tree-lined avenues radiated from the park, being interconnected at regular intervals by concentric boulevards, which ranged outwards from the park in ever widening rings as far as the eye could reach. I counted twenty of these ring boulevards altogether, and found that they divided the strange city into twenty-one distinct circles of city blocks. But the most remarkable feature of the city was the fact that each one of these rings of city blocks was of a different color. Beginning with the deep red of the outermost, and finishing with the brightest violet of the innermost ring of buildings, all the colors of the rainbow were represented, each of three shades, which blended perfectly into each other. Never had I seen a more wonderful color scheme.

But my interest strayed quickly from the buildings to the inhabitants themselves—thousands upon thousands of tiny, colored mites, of whom as many appeared to be in the air as upon the ground. I seemed to descend again now—caught glimpses of happy people and children in the air and upon the grassy spaces of the park —and then I seemed to be standing upon the bottom step of a great white circular palace.

The vision carried me up this stair of nine steps and through the colonnade into a vast and lofty chamber, a place of purplish twilight and shadows—silent and mysterious like the interior of a great cathedral. In awed wonder I glanced about me, and my gaze came to rest upon a silent group of twelve men, seated in a circle upon what appeared to be low cushioned stools.

The vision passed across the vast, tesselated floor of polished stone, and came to rest quite close to the twelve. They were all dressed in long gown-like garments of bright violet color, held together at the waist by a sort of thick cord. The faces of some of them were hairless, and some wore long white beards; but there was a something, an indefinable air about them, which proclaimed them of vast age; and the impress of great wisdom was in the face of each.

The sat absolutely motionless, with crossed legs and folded hands, and their eyes were half closed as if they were meditating deeply. But presently he who appeared to be the oldest and most venerable in the group, raised his head and began to speak sonorously. Meanwhile with a long, thin rod of silvery metal he pointed to the floor within the circle of chairs, where, in some miraculous manner, the starry heavens seemed to be reflected, being quite plainly visible in the dim light of the chamber.

"No doubt remains, councillors," the solemn, deep voice began. "Our planet, and probably most members of our solar system, are doomed to either partial or complete annihilation!"

He ceased for a moment as if to let the awful import of his words sink into the minds of his companions, and his penetrating gaze passed slowly from one to another. He resumed:

"I have again gone over my calculations with the utmost care, hoping to the last that possibly I had been mistaken, and that our solar system would be saved from a tremendous, unthinkable calamity. But my sums checked perfectly, and the result remains the same: An immense swarm of meteors will strike the sun at the precise time which I have foretold, and the resultant explosion with its incalculable heat and burning gases will doubtlessly destroy partially or wholly our entire solar system of thirteen planets and twenty-nine satellites."

The speaker ceased and leaned back in his chair, calmly waiting for the others to speak, while again his analytic gaze observed the grave faces of his fellow councillors. There was a deep silence for several moments.

"It will be an awful calamity for all the people of the inhabited planets," one of the twelve said with utmost gravity. "Is there then no hope for our people, venerable master?"

The patriarch inclined his regal head, and spoke slowly:

"Ever since my calculations have revealed to me the coming catastrophe I have been secretly endeavoring to find a way to save our people; and I have been successful." He noted the intent and expectant faces of the eleven, and continued:

"In a manner which some of you will understand I have succeeded in discovering, deep down in the interior of the earth, a chain of immense, interconnected caverns, several of them with rivers. It is that subterranean region which will be the new home of our people. If the earth is completely destroyed, then of course everything will be for naught, and we will all be destroyed with it. On the other hand, if our planet

is not wholly annihilated, there is a chance for us to survive."

Again the patriarch waited for one of the others to speak.

"But is there light to see by, air to breathe, and soil to grow food in, in that subterranean land, venerable master?" one of them inquired deferentially.

"Neither of those elements exists there now, with the exception of a little oxygen from the water in the rivers," was the quiet reply. "But we shall create them. We must create these necessary elements, because our millions of people must be saved; else what use would our science be. Let us therefore begin the task immediately. What says the council?"

Immediately eleven pairs of hands, with the index fingers fully extended, rose into the air.

The patriarch nodded gravely. "It is well. So shall it be!"

Into the Earth

THE vision faded—disappeared. Again a period of time seemed to pass. Then there was a new scene.

I seemed to hover over an immense plain, near a cluster of extensive, flat buildings, through the many doors of which a multitude of busy, half-clad men passed continually in and out. Great piles of building material of all sorts were arranged in an orderly array about the buildings, and these materials the workers conveyed into the buildings by means of various kinds of self-moving vehicles.

The vision passed into the largest of these buildings, and immediately I viewed an extremely busy scene: An innumerable multitude of the half-clad, brawny workmen were putting the finishing touches to the thousands upon thousands of strange vehicles with which the place was crowded. Each of these vehicles consisted of a long metal cylinder, curved laterally like the segment of a spiral, and ending at each extremity in a head resembling that of a huge cannon projectile. Along each side and its bottom ran a line of massive castings, into each of which a solid wheel had been fitted. That was all which one could see from the outside. But I did notice that the periphery of each wheel was rounded, like an automobile tire, and that only a small sector of the bottom wheels was visible. Here, somewhere on the inside, where the bottom wheels emerged, was the driving mechanism I judged. The head of one of them —or it might have been the rear end—was swung open on great hinges, like a door, and I glimpsed the electrically lighted interior. I said electrically lighted, because that was what the luminous semi-globes in the ceiling of the vehicle appeared to be. And by their bright light I saw a long row of comfortable seats, racks for baggage against the walls, and at the far end, which I now positively identified as the front end, I glimpsed a well-lighted panel mounted with a number of switches, levers and knobs, and before this a single seat; the station of the operator without a doubt.

Suddenly a movement went through the mass of workers, and their eyes focussed upon a certain point. The vision shifted and I saw the reason: through the main portal of the building a striking group of men had entered, and I immediately identified them as the twelve members of the council whom I had seen in the white palace, or temple, of the city of the Primarians. With the patriarch leading, they made they way in a leisurely and dignified manner to a place near the entrance, where a great metallic tube, like a section of a subway, rose out of the ground laterally, at an angle of about fifteen or twenty degrees. Quite close to this one of the queer, completed vehicles had been placed, through the open rear of which the council of twelve entered it and seated themselves.

During all this time I had been wondering how it was possible for the huge vehicle to maintain its equilibrium; for, unlike the others which were not yet in use, it was not supported with props, but was standing free upon the single row of wheels on its bottom. But suddenly I perceived the reason: the heavy, laterally placed wheels, or rather solid discs, at the sides of the huge cylinder were revolving at such high speed, that until now I had been sure that they were stationary. It was, of course, quite plain to me now that the gyroscopic action of the massive wheels—there were six on each side—held the vehicle in an upright position.

The vision passed into the interior of the vehicle now, just as if I were actually entering it. A narrow aisle ran the entire length of the car, and on each side of this were ranged the seats, with room for three grown persons in each. I counted thirty of these seats on each side; which meant a capacity for one hundred and eighty passengers. The council of twelve had occupied the first two rows of seats. Beyond and ahead of them, in the very nose of the vehicle, was the control compartment; consisting of a slanting table, upon which a number of shining levers, knobs, and peculiar indicating instruments were mounted. Two operators, clad in the ordinary simple tunics of the people, were seated in front of the controls.

And even as I watched them curiously one of them threw a lever, which caused the rear end to close with a gentle slam, while the other manipulated several knobs and levers, setting the vehicle in motion. It is evident, of course, that I could not feel the motion of the car, due to the fact that only two of my senses, that of sight and of hearing, were represented. But in front of the two operators was an upright screen, similar to the reflecting screen of a periscope, by means of which it was easy to perceive everything that was going on outside.

We were slowly and smoothly entering the great, inclined tube which led into the depths of the earth. The vehicle tipped forward as we made contact with the inclined plane. But one of the operators shifted a lever, and immediately we were level again. With ever increasing velocity we were descending into the bowels of the earth.

The observation screen showed a vista of brightly lighted, curved walls ahead, and I realized in amazement that we were traveling down a shaft, a continuously winding shaft, formed like the threads of a screw! The bottom of this winding shaft was shaped like a very shallow capital V with a blunt apex, and it was this apex which formed the track for the bottom wheels of the curved vehicle, whose curve, by the way, fitted the curvatures of the shaft perfectly.

Arrived!

As soon as the car had gathered momentum, the operators shut off the driving power, and henceforth we were hurling onward into the depths by gravity alone.

Down! down! down! with a speed which was becoming moment by moment ever greater. I wondered what would happen if something should go wrong or break. But one fact struck me as very significant: despite the tremendous speed at which the vehicle was now shooting downwards, there was no noise beyond a soft humming. It was an eloquent testimony of super excellence in designing and construction on the part of the Primarian engineers.

We must have traveled thousands of miles, when finally the two operators began to check the frightful speed of the machine. And then presently after a long interval during which the vehicle attained normal speed, we shot out of the shaft into an immense, brightly lighted space.

We had arrived!

The rear of the vehicle was open, and the vision passed outside with the venerable council of wise men. Immediately I realized that we were in the great cavern where the city of Raa was situated, or at least one similar to it; for high overhead shone the multitude of miniature suns, pouring their golden light over everything.

It was very puzzling, this mingling of the dim past and the present, and it was quite impossible for me to realize that I was witnessing events which had happened during a highly civilized era in the world's history, two millions of years ago.

Near the entrance to the shaft hundreds of workmen were busy at a series of great ovals of metal, to the sides of which sets of gigantic wings were attached. The council of twelve entered the nearest one of these, and by means of the magic vision I entered with them. The two operators of the airship started the invisible machinery, and to the rapid, droning motion of the four sets of great wings it rose majestically into the air at a slight incline, righted itself, and shot away at an even keel at prodigious speed. And now, gazing backwards, I noticed that there was a second shaft entrance visible, several hundreds of feet farther on in the great rock wall of the cavern. No doubt it was the return shaft by which, during the coming emigration of the Primarian people, the empty vehicles were to rise to the surface after having discharged their human freight. And upon contemplating this, I marveled again at the wonderful sagacity of their scientists, and wondered too how and by what magic means they had been able to drive a shaft of such shape and length through the thousands of miles from the surface of the earth. Truly they must have used a far superior system to mine.

At the bank of a great river the huge airship landed gently, and the twelve wise men stepped to the ground. With his back to the river, the patriarch allowed his gaze to travel over the large stretch of level ground, and then waved his right hand towards it.

"Here the capital of our new land shall be built," he announced gravely. "And it shall be called Raa, seat of wisdom."

CHAPTER XI

In the Grip of Sarro

SUDDENLY an icy touch against the base of my brain brought me back to reality. Like once before, when first entering this strange land, my body was instantly paralyzed, and every vestige of strength seemed to have left it. The next moment I was jerked roughly from my seat, and found myself in the grasp of four husky Raanians.

I happened to be facing in the direction of my nephew, and saw that he too had succumbed to the touch of a Kra. But it was not that which sent a sudden stab of fear through me, it was the fact that above Teddy's prostrate body hovered a figure that I recognized as that of Sarro, the man whom he had defeated, the powerful minister of the Raanian police. And there was a sardonic smile on the man's face which gave him a touch that was truly satanic. At that moment the words of Noama flashed into my mind, "he will never rest until he has fully revenged himself for the insult to his pride which you have inflicted on him." What possible chance had we against such a powerful enemy? How could I possibly aid my dear nephew against Sarro, helpless as I was myself?

In response to Sarro's imperious order, four men placed Teddy onto a carrying net, while four others attended to me in like manner. A few moments later they had carried us to the roof, and rose with us into the air; each beat of their powerful wings carrying us perhaps toward death.

In what seemed a very short time we had arrived at our unknown destination. I recognized the place instantly: It was the great semi-spherical building of flaming crimson about which Teddy and I had speculated when we had first viewed the city!

We landed just in front of the massive double portal; and without delay Sarro drew from his belt an instrument like a small flute, and sounded four sharp descending notes, followed immediately by four ascending ones. No sooner had the sound of the last note died away, than the ponderous wings of the wide portal swung silently open, and we were swiftly carried inside.

A wild chorus of bestial roars and screams greeted us as we emerged out of the gloomy passage into a vast circular court, and for a moment I thought that the place was on fire. I immediately perceived that the flaming ruddy radiance with which the great court was filled was due to the outer light passing through the roof of crimson-colored glass overhead.

My first impression was that we had entered a zoological garden, for the entire court was surrounded by three tiers of strongly barred cages, the upper tiers receding backwards from the lower, like steps. But with a shock of utter horror I quickly realized that the frightfully distorted visages staring out at us through the thick metal bars were human—their big, wild eyes, saliva-dripping and snarling mouths, and hairy features causing them to appear like so many demons from hell itself. The explanation shot into my mind like a white-hot bullet into the brain. There could be no mistaking the situation: This was the madhouse of Raa, and Teddy and I had become inmates of it!

We were in the merciless grip of Sarro, and this was his revenge.

They hurled us brutally into two empty, adjoining cells of the lowest tier, and resuscitated us with a Loo. But before we had regained enough strength to make a break for liberty—almost hopeless as it was under the conditions—they had slammed our doors, and from the outside stared in at us mockingly.

In the crimson light from above, Sarro's face was more satanic than ever. He shouted a few words through the din of the madmen at Teddy, and although I could not, of course, understand what he said, the malignant smile which accompanied them was sufficiently eloquent to make me shudder for the safety of my nephew. But Teddy merely laughed at the big Raanian contemptuously, which appeared to infuriate the latter intensely. Realizing that neither of us could understand him, he gestured significantly toward a sinister object which stood in the center of the court, and then he and his men quickly left the court.

"Great Jupiter—what a place!" Teddy shouted through the infernal din of the madmen, the nearest of whom were crowding against the bars of their cages with the evident intention of viewing us. "What devilry do you suppose Sarro is up to?"

We were both standing close against the heavy metal bars which separated our cages, but even by means of shouting it was almost impossible to carry on a coherent conversation, so great was the noise due to the roaring and screaming of the madmen.

"I don't know, Teddy," I replied. "But I didn't like his face when he pointed out that thing there, in the center of the court."

The object in question was a sort of high, metallic table, resembling an operating table, from the sides of which broad, heavy straps dangled down. Four heavy columns of metal rose from the corners of the apparatus to a height of about three feet above its somewhat slanting top, and on their flat upper ends a thick panel of dark gray material was placed. To the underneath side of this panel a number of curious tubes and rods and balls of crystalline substance were attached.

"Tell you what, uncle Ned," Teddy said grimly. "I bet a dozen pairs of new socks that it's some sort of torture machine, and that Sarro intends to give me a taste of it."

"Heaven forbid!" I cried horrified. "That would be terrible. Better be dead than anything like that."

Suddenly the noise of the madmen rose to such a pitch that further conversation became quite impossible. We were not long left in doubt as to the cause for this. A party of six men, under the supervision of a seventh, entered the court, bearing large baskets filled with raw bloody meat, which they at once proceeded to fling through the bars into the cages of the unfortunate madmen, like one feeds captive, wild animals. And even like wild animals the dehumanized prisoners pounced upon the bloody chunks of meat, and amidst snarlings and growlings began to devour it ravenously. It was a most abominable, nauseating sight, and I was devoutly thankful that no food had been provided for Teddy and me. I am sure it would have been impossible for either of us to eat a single bite.

The Torture

SEVERAL hours later Sarro returned with four of his strongest men. The vast, arena-like place was unusually quiet, because most of the unfortunate prisoners were lying on the bare stone floor of their cells in a sort of dazed condition after their horrible meal.

Following their master's sharp order, Sarro's men opened one of the cages, and dragged forth the struggling and screaming inmate, whom they immediately strapped to the sinister apparatus in the center of the court. When they had completed their task, Sarro strode to the front of Teddy's cage. For a few moments the two men gazed at each other; my nephew coolly and unafraid, and the big Raanian malignantly. Presently a sardonic smile contorted the latter's face, and his gesture quite plainly invited Teddy to watch the screaming victim upon the table in the center. Then, without having spoken a word, he turned his back and walked over to the apparatus.

The screaming of the unfortunate madman had aroused all the others, and the place was now in a hellish uproar. Everywhere we could see fear and hate-distorted faces pressed against the metal bars of the cages, all eyes concentrated upon that nameless scene in the center.

Sarro was standing at the head of the strapped man, gazing down at him with a vicious scowl. He raised his right hand and manipulated some mechanism at the edge of the panel above the victim, and immediately one of the crystal balls flashed into life. A white-blue ray shot down from it to the wide-open mouth of the man, and his screaming ceased abruptly. His face contorted with unutterable pain, and a stream of black, smoking blood issued from his nearly closed mouth.

I heard Teddy nearby cry out in horror. He grasped and shook the bars of his cage in a sudden frenzy of anger. "You damnable fiend of hell!" he yelled at Sarro above the clamor of the madmen. "Some day I'll make you suffer for that!"

Even if the pitiless, torturing arch fiend did not understand my nephew's words, he seemed to guess their import from the expression on Teddy's face. But this did not seem to anger him. Instead it appeared to please him.

He leaned back and roared with ugly laughter, in which his four henchmen joined him with gusto, as if the whole matter were some delightful joke. Quickly he manipulated another mechanism, and at the same time shut off the power from the crystal ball. A tube just above the tortured man's head glowed suddenly. No visible ray descended from the tube; but we watched in horrible fascination as the black, coarse hair of the unfortunate turned rapidly white, shriveled up, and then disappeared entirely. But still that monster in human flesh did not turn off the terrible invisible power. And presently we were further horrified to see the bare scalp turn to a dark red color and bluish smoke begin to ascend from it.

Again Sarro laughed in our direction as if our attitude, and especially that of my nephew gave him pleasure. I hoped that perhaps the frightful ordeal had

reached its end. But not so. For the big Raanian had no sooner turned off the power of the glowing tube, when two thin pendant rods, a couple of inches apart, burst into radiance, each sending a thin purple ray to one of the suffering madman's eyes. Utterly appalled, Teddy and I watched the quick swelling of the eyeballs, until they protruded entirely out of their sockets. Rapidly they increased to enormous proportions. The man did not move, and I hoped that death had mercifully come to end his tortures.

But it was the end of Sarro's hellish performance. Quickly his men unstrapped the motionless body, and hurled it to one side on the floor. And then utter fear gripped me when I saw Sarro and his men approaching Teddy's cage.

But only for a moment or two fear held me. Then a terrible anger replaced it. In that moment I realized what murder lust meant, and knew that temporarily I had become a throw-back to a primitive age.

"Fight to kill, Teddy!" I roared fiercely. "Drive them over here to me so I can grab them from behind!"

A Dash for Freedom

HE signified that he understood, and then faced his oncoming enemies with a savage grimness that thrilled me strangely. Suddenly the door of his cage was flung open, and the five Raanians were upon him.

Crack! crack! crack!

Teddy's powerful fists shot out with the lightning speed and deadly accuracy of the trained fighter. He was battling for his life and more, and he knew it. He killed the first man who reached him with a single snapping blow against the fellow's windpipe, broke the jaw of the second one, and rammed the third in the solar plexus with a force that flung him half a dozen feet away. His head struck the stone floor, and he lay still.

"Look out behind you, Teddy!" I cried in warning.

Instinctively he ducked, and avoided Sarro's Kra by the merest fraction of an inch. Yet so eager had the big Raanian been in trying to jab the dangerous weapon against Teddy's neck, that the latter's ducking threw him forward, off his balance, and the loaded Kra touched the man whose jaw Teddy had broken, and who had valiantly returned to the fray. The terrible electrical charge of the weapon killed the man instantly, and before Sarro could charge it again, Teddy's fist crashed against his temple, rendering him unconscious.

But in that moment the most powerful of Sarro's men, the only remaining one, tackled my nephew from behind, and encircled him with his long, powerful arms.

Teddy was completely helpless in the big man's grip, and things began to look bad; for at any time Sarro might regain consciousness, or some others of his men might enter the place.

"Try to roll over here to me, Teddy!" I shouted above the bedlam of the excited madmen, who seemed to realize what was going on.

Teddy understood. With a sudden, unexpected motion he hurled his body sideways, so that the huge Raanian's back almost touched the metal bars where I waited with fierce eagerness. The next moment my arms had shot out between the bars, and I encircled the man's neck in an unbreakable strangle hold. With savage exultation I flexed my muscles to their uttermost. His big body gave a few convulsive jerks and then he lay quite still. I had broken his neck.

In the meantime Teddy had caught up Sarro's Kra, had slipped out into the court, and now slammed the door of the cage on the dead and unconscious Raanians. In a moment he had loaded the Kra, and was at my cage door, demolishing the lock. I pushed open the door and leaped to his side.

"Come on, let's get out of this while we can," I shouted.

"I wish I had it in me to kill that arch demon," Teddy said as we ran toward the portal. "But I can't very well kill an unconscious man. That's the main trouble about being civilized."

"He deserves being killed half a dozen times," I admitted vengefully. "Because he is bound to make us no end of trouble in the future."

CHAPTER XII

The Escape

JUST inside the portal, on special holders, we found the flying apparatuses of Sarro and his subordinates. Without delay we helped each other into two of them, glad that our loin and breast belts had receptacles for them.

"Chances are we'll break our necks with these things the first time we try to fly with them," I said dubiously. "Personally I know about as much about running one of them as a Chinese laundry man knows about running the United States mint."

In spite of our dangerous situation, Teddy laughed heartily.

"Don't forget that we may soon be angels, uncle Ned," he joked. "And in that case a little preliminary wing practice would help a whole lot."

With admirable forethought he had taken from Sarro's belt the small flute with which, in an apparently magical manner, the latter had opened the great portal when they had first entered that awful place. Teddy's sharp ears and keen memory for music served him well now. For he imitated with utmost precision the brief tune of descending and ascending notes that Sarro had sounded, and with the last note the ponderous wings of the portal swung silently open.

"How do you suppose that opening and closing mechanism works?" Teddy inquired as we passed out. "By radio control?"

"Must be something on that order," I agreed. "The particular sound impulses from the flute probably act upon some sensitive diaphragms which change sound vibrations into electrical impulses."

I sighed with relief as the closing portal shut in the awful screaming and roaring of the excited madmen, frenzied by what they had witnessed. Death would be a hundred times preferable to returning to that place of horrors.

Luckily for us the grounds about the madhouse were deserted. We lost no time in hurrying into the dense shrubbery which surrounded the open space about it, on the side away from the town, and did not stop until

we reached a little glade. Here we decided to try our wings; for we realized that we had but very little time to spare before some one, probably the food carriers, would enter and our escape would be discovered. We knew too that Sarro in his rage would not lose a moment in pursuing us. And we further knew that being caught would mean something far worse than death; Sarro would see to that.

It did not take Teddy long to catch on to the operation of the flying apparatus, and he seemed to enjoy the experiment immensely.

"It's not a bit difficult, and it's bushels of fun," he announced jubilantly when he had landed nicely at my side. "Here, let me explain."

In a far shorter space of time than I had dreamed possible I too had caught on to the amazingly simple operation of my flying machine, and we started on our predetermined trip without further delay.

Based upon what we had learned from the marvelous electronic recording machine, we soon oriented ourselves; and using the great river for a guide we flew along its course until we should come to a peculiar bend in it, which we remembered as the first contact that the Primarian council of twelve had made with the river when coming from the entrance of the shaft. We were confident that thus we would be able to get the approximate course to what Noama had called "the forbidden gate."

"I wish we had some food to take along, though," Teddy complained. "I feel half starved already. How about foraging for something in one of those orchards below?"

"All right," I agreed readily. "But we've got to make it snappy. We can't afford to waste much time, you know."

We had been flying high, dizzily high for me, so as to keep out of sight of occasional flyers and the rare, huge, bird-like airships which we glimpsed now and then in the distance. But now we dropped sharply downwards on a steep incline, steering ourselves with our feet. For it will be remembered that the lower tips of the wings were fastened to the foot coverings. All my life I had been subject more or less to vertigo, and now I was completely amazed to find that the flying itself made me scarcely dizzy, and moreover that I enjoyed the experience almost as much as my youthful nephew. It is marvelous how adaptable the human organism is; especially under stress of circumstances.

There were no workers visible in the orchard where we descended, for which we felt grateful. It was evident that the less we were seen the better for us in the event of pursuit. It did not take us long to fill the capacious pockets in our belts with various kinds of fruit. And after a hearty drink of water from a spring, we took to the air again, eating as we flew, for all the world like a couple of birds.

An hour or so passed, and then suddenly the dense atmosphere reverberated once again to the awe-inspiring sound of the great bell which as yet we had never seen. The same thought struck Teddy and me at the same time, and we looked at each other significantly.

"I bet a dozen pairs of new socks that our particular friend, Mr. Sarro, esquire, is ringing that big dinner bell for our special benefit," Teddy commented. "He is no doubt even now collecting a posse and smelling out our trail."

"Yes, I'm inclined to believe you're right," I agreed. "The ringing of that bell might well be the alarm that we have escaped. Of course we might be wrong at that. Let's hope so."

At the Gate

OUR immediate goal, the peculiar bend of the river, was just ahead. We passed over it, flying now very high, and struck out for that vast dimness in the distance where we knew the great walls of the immense cavern formed the limits to this subterranean empire.

At the river the fertile lands terminated abruptly. From then on we traveled over a vast, arid and stony region, which, unlike the region of farm lands, was only dimly lighted by scattering miniature suns. Again, like many time previously, I wondered interestedly what the mysterious source of their radiance, and what the power of their rays might be. That their light and energy rays were almost, if not exactly, identical with that of the real sun was attested by the extraordinary luxuriance and productiveness of plant life about Raa, and their heat-giving property. But I doubted if the little suns generated any ultra-violet rays, because I had never seen the least sign of tan in the complexion of any of the inhabitants. I wished that I had time to fly up to one of them and investigate. But that, of course, was now out of the question. The main thing was to escape back to our own world as speedily as possible.

For quite a while Teddy had been almost morosely silent; and I guessed that he was thinking of the fascinating Noama, and that the realization that he was never going to see her robbed the prospect of going back to our own world of nearly all its attraction.

Presently the vast forbidding walls of the cavern loomed ahead of us, and at their foot we glimpsed the entrance to one of the ancient shafts, surrounded by a high wall of stone. The sight brought Teddy out of his revery, and he became almost his old, cheerful self.

"What ho!" he cried grinningly. "The gate to liberty in sight, and still the villain doth not pursue. It doth not seem right."

"Which is exactly my opinion," I answered seriously. "In all likelihood Taman has advised Sarro that it is our intention to escape, and that we are to be watched closely. Those two shafts ahead there being the only possible avenue of escape, there would be no need for him to look anywhere else for us. Of course, we might have been mistaken about the ringing of that bell, and our flight might not have been discovered yet."

We had been flying downwards at a sharp angle, like a descending hawk, with our wings stopped, and now slowed down gradually by spiralling; a trick which Teddy had learned from an aviator friend and his plane.

There! Was it merely my overwrought nerves playing tricks with my vision? But I could almost have sworn that just a moment before we landed in front of the massive gate of the enclosure, I had glimpsed the stealthy movement of several sinister shadows within its thick stone walls.

I mentioned the matter to Teddy, but he merely

laughed at my fancy. Then, gazing at me quizzically, and imitating my voice to perfection:

"I am afraid you're letting your imagination run away with you. Do you, perchance, remember a certain white bat? Well—"

With one accord we broke into hearty laughter.

"Nevertheless, I believe in preparedness at all times," I persisted.

A short search round about revealed a long sliver of tough, flint-like stone. It was about three feet long and three cornered, and one end of it terminated in a jagged point. With this in hand I felt better.

The Guardians of the Portal

"SINCE for some reason we have forgotten to bring the key, I'll simply have to ruin this nice lock with Mr. Sarro's Kra, I guess."

We were standing before the great double gate in the high stone wall, gazing with interest at the huge lock set into the middle of the perfectly wrought joint between the two wings. There were two oval-shaped holes in the lock, which might or might not have been keyholes. However, Teddy made short work of the lock with the Kra.

This done, we placed our shoulders against one of the portal wings and pushed with all our might. Slowly the ponderous metal panel swung inwards. With the Kra held ready in his right hand, Teddy leaped eagerly through the narrow opening into the small court. There was a sudden harsh roar, and I followed just in time to see him go down under the impact of a huge, tawny-colored animal.

I had not been mistaken after all!

With all my strength I crashed down my stone club onto the creature's great head. Apparently dazed it rolled to one side, and to my infinite relief Teddy scrambled quickly to his feet, and touched the animal with the charged Kra, killing it instantly.

Nevertheless, he was not a moment too soon. Because now, from the shadows of the walls, two more of the tiger-like beasts were creeping quickly towards us, beating the floor of the little court viciously with their tails, and growling ominously. The one confronting Teddy jumped first. But with his trained quickness of eye my nephew had timed the great cat's motion accurately, and evaded its attack by a lightning leap aside. The animal hurtled harmlessly past him, and before it had recovered from its missed jump, he had touched its spine with the Kra and killed it.

I found out about all this afterwards though. Because, while my nephew was busy, my own attention was entirely required in my own defense. With a shock of incredulous amazement I realized for the first time the nature of the beast confronting me. Often enough I had seen pictures, and had read paleontological descriptions of it. Without a doubt it was the direct descendant of a sabre-toothed tiger, although perhaps smaller in size than its progenitor.

For a moment or two the beast and I were watching each other. I gripped the stone club with both hands like a short lance, and raised it above my right shoulder. He leaped; and with all my strength I drove the point of my primitive weapon straight in between his terrible, slavering jaws.

I sensed the terrific impact of the tiger's body—was conscious of a searing and burning pain in my right side—had the awful feeling that the breath and life was being crushed out of me under a great weight— And then I suddenly realized that the crushing weight was gone, and that Teddy was speaking to me anxiously.

"Great Jupiter! You gave me quite a scare for a few moments," he was saying. "I thought that hell cat had killed you."

With the Kra, Teddy had killed the three formidable guardians of the shaft portal, and the way to the surface lay open. I was glad to learn that he had come out of the short battle without a scratch; for the folded wings on his back, and the base of his flying machine had protected him from injury when the first tiger had attacked him. But I, having had my front toward the beast which attacked me, had not been so lucky. One of the tiger's razor-like claws had made contact with my right side, and had laid open the ribs for a distance fully six inches long. The wound was bleeding profusely, and from it the torn flesh hung down like a wide, bloody ribbon.

The worst about the matter was that we had no ointment, not a scrap of bandage, and not even a knife. I pointed to the great circular door of reddish metal which concealed the mouth of the shaft.

"Open that door with the Kra, and make a break for liberty, Teddy," I pleaded. "I'm done for with this wound. Leave me the weapon, and I'll use it in case Sarro and his bunch comes. They'll not take me alive. It doesn't matter about me anyway; I am old. But you've got all of your life before you yet."

But instead of doing what I requested, Teddy gazed at me in deep reproach.

"I didn't think you would consider me capable of such an inhuman and cowardly act, Uncle Ned," he said. "If you can't go, I'll stay with you, and that's all there is to be said. Now just lie still and hold that torn flesh in with your hand, while I fix some bandages."

Pursuit!

HE caught up a loose stone and with this broke off one of the sharp tusks of the nearest tiger. Using this for a knife, he quickly proceeded to slit open the skin of the animal at the belly, until he had several long strips ready. As gently as possible he removed the flying apparatus from my back, and wound the improvised bandages about my body, pressing the strip of flesh in place over my ribs. The ends of the still warm strips of hide he fastened together by means of lacing them with narrow strips. It made a most wonderful difference in my feeling, easing the pain greatly.

"You are a most noble boy, Teddy," I said gratefully. "I'll try to stick it out. Now let's move as quickly as we can. I have a feeling that Sarro is on our trail."

During our trip we had decided that, since beyond the little fruit we had gotten in the orchard we had no provisions of any kind, nor water, it would be physically impossible for us to climb the many miles to the surface on foot. It would have taken us probably more than a week even with a supply of food and water. There re-

mained only one possible, but uncertain, means of reaching our goal—we would try to make the trip by means of our wings.

"I wish we had one of those queer passenger vehicles that the Primarians used?" Teddy said longingly, as he carefully replaced the flying apparatus onto my back. "With one of them we could be on the surface in a jiffy. I wonder what became of all those thousands that escaped being destroyed by the cataclysm?"

"They were probably destroyed, or scrapped, and the metal used for some other purposes," I suggested. "Even if some of them had been saved and were in working order, say for museum purposes, you may be sure that Taman and his council would not leave them in any accessible place, or anywhere near these shafts. They would no doubt be too great a temptation for some of the more venturesome among the younger Raanians."

Teddy supported me to a water trough of stone he had discovered, the drinking place for the tigers, no doubt, and both of us took a long drink from the fairly fresh water it contained. Then we made our way to the portal of the shaft. Teddy quickly opened it with the Kra, and as he swung back the massive disc of metal on its great hinges, a musty odor streamed from the dark space beyond it. We were just about to start into it, when a sudden intuitional impulse caused me to glance upwards. Like vultures a swarm of Raanian flyers were gliding swiftly and noiselessly towards us. Teddy saw them at almost the same moment.

In less time than it takes to tell he had swept me into the shaft, and then swung himself about and grimly waited for them, gripping the Kra in his right hand. Beyond him I saw the enclosure fill rapidly with silent men in yellow and purple uniforms, and knew that Sarro had found us after all. And presently I saw him, staring at Teddy mockingly from a short distance away.

A faintness, doubtless caused by the considerable loss of blood from my wound, came over me gradually, and I sank slowly to the stone floor of the shaft. With all my might I struggled against the condition which threatened to overcome me—but suddenly an abysmal blackness seemed to engulf me, and swept all consciousness from my mind.

CHAPTER XIII

In Prison Again

I OPENED my eyes to find Teddy bending over me in deep anxiety. His forehead was heavily bandaged to the top, one of his eyes had a pronounced "shiner" and his nose was quite a bit swollen and discolored. A smile of relief quickly replaced the anxiety on his face when he noted that I was conscious.

"Glad to see you back on earth, Uncle Ned," he welcomed me cheerfully. "You certainly missed a bear of a fight out there at the forbidden portal. I had a wonderful time while it lasted; but it wasn't any use. They finally downed me, and brought us back to Raa."

I turned on my bed, and glanced at the couch opposite, and at the table and chair between the two. Somehow the color and shape of the furniture was familiar, and so was the pattern and color of the wall decorations. Wonderingly I glanced at Teddy. He nodded grinningly.

"Yes, it's the same place all right. They've brought us back home to jail. We arrived only about an hour ago. An old doctor, with whiskers a yard long was here just now, and fixed your side with some liquids and one of those Loo things. How does it feel now?"

"Seems to feel surprisingly good." I answered. "How about your head? Did they open up your old wound, or is it a new one?"

"It's a new one," he said with a wry grin. "One of those flying cops struck me with something and knocked me dizzy; and then somebody else, our friend Sarro I guess, touched me with a Kra and put me out of the game. But I enjoyed myself thoroughly while the fun lasted. You ought to have seen the faces of some of the others. The old doc fixed me up too."

I gazed affectionately up into his sparkling eyes.

"Good boy!" I commended heartily. "I hope you landed a few good ones on Sarro. By the way, did you happen to learn what they intend doing to us?"

He smiled grimly and nodded.

"As soon as we are out of the old doc's hands, we are going to be tried before the supreme council of Raa, with Taman, the governor, presiding. I guess you know what that means."

"And another thing—" he added, "they've put a couple of jail guards up on the roof, so that we're pretty well bottled up. I wonder if Noama—"

He turned suddenly toward the door, and there she was, just as if the thought of her on his part had magically produced her. She smiled at me in quite a friendly way, but did not enter the room. Instead she beckoned to Teddy, and they went off together; to the entertainment room I guess. Noama had appeared in a hurry, and I wondered what was up. About half an hour later Teddy returned alone. He seemed to be greatly elated.

"She's a wonderful girl!" he cried enthusiastically. "She came here against her grandfather's solemn command, in order to tell us that she would do everything in her power to help us."

"But how about the two guards on the roof?" I inquired. "Didn't they try to stop her?"

He chuckled delightedly.

"I asked her that too; and she told me that before she landed on the roof she ordered the two men to stand at the parapet with their backs turned to the entrance, and not dare move from the spot until she told them to. She's a real girl, Noama is!"

"She'd better watch out for Sarro." I said dubiously. "If he ever finds out about this visit, he'll take the news straight to Taman, you may be sure of that. Besides, he'll watch her so closely that she will never get a chance to help us."

Teddy was silent and thoughtful for a long time.

"Do you know, Uncle Ned," he confided at last, "I never used to think much about girls. But I've come to the conclusion that life with a girl like Noama would be a wonderful experience."

* * * * *

A great crowd of curious people awaited our coming, as, between our guards, we entered the spacious courtyrda of the great white pyramid, and were marched

through a side entrance into another ante-chamber, not as spacious as the one inside of the main entrance, where Sarro and several of his lieutenants awaited us.

There was a smile of malicious satisfaction on his satanic face as he personally examined the heavy chain manacles on our wrists, which held our hands close together before us, and I knew that as far as he was concerned we were already condemned before we were judged.

A door opened, and, with Sarro leading and two of his lieutenants bringing up the rear behind us, we passed into the great chamber beyond.

The vast apartment had the form of a perfect right-angled triangle, and was done almost entirely in a funereal black. Black stone of marble-like sheen formed the high, vaulted ceiling, and panels of the same material and sombre color constituted the three walls, each panel separated from the next by graceful half-columns and arches of startling violet color. The tesselated floor was almost entirely of triangular, polished slabs of ebon, with the sole exception of the apex of the great chamber, directly in line with the door whence we had entered, which, in violent contrast, was of snow-white stone in the form of a large sector of a circle.

Condemned!

A MASSIVE, throne-like chair of crystal had been placed onto a sort of dais in the very apex of the white sector, and from this elevated position the tremendous figure and awful personality of Taman, the Thrice-Wise, dominated the strange, forbidding scene. His large, luminous and penetrating eyes were regarding Teddy and me like the devastating orbs of an avenging god.

Below the dias, at his right, three solemn-faced councillors were seated, while an equal number occupied the space at his left. I recognized the two councillors nearest to Taman as the two venerable guides who had first conducted us two adventurers into the awful presence of their chief. A few yards to the front of either trio of councillors stood a large table, also of black, polished stone, at each of which two men, evidently court clerks, were waiting with ready electric stylus and recording tablets. One young man stood at each of these tables —junior scientists, if one judged from their unadorned, gown-like garb of yellow cloth—holding several sets of Sonaa.

A large, half-globe of crystal in the ceiling flooded the room with a strange, unearthly radiance, which somehow appeared to accentuate the harshness in the faces of the councillors and their chief, rendering their features inexpressibly severe and pitiless.

Everybody in the room, with the exception of us five newcomers, had already been supplied with a set of Sonaa; and now the two young scientists at the tables approached us, and quickly equipped us likewise. As if at a signal, each one of the four clerks raised his stylus in readiness, and the court proceedings began.

Taman fixed me with a piercing gaze, and addressed me

"You and your companion have been accused by the minister of police of opening and entering the forbidden gate, and attempting to escape to the surface," he said sonorously and ominously. "Do you admit the charge?—or do you deny it?"

I figuratively gripped my courage with both hands, and forced myself to meet his intense, accusing gaze with a bold one of my own.

"The charge is true!" I stated coldly. "Neither my nephew nor I care to deny it. It was the natural thing for us to do. And furthermore, I know I can speak for both of us when I say that I deny you or anyone else the right to prevent free-born, American citizens from returning to their own land!" The last few words I had spoken sharply and incisively.

Taman's great eyes burned with a terrible anger.

"Spawn of an accursed race, do you dare to defy the supreme council?" he thundered in an awful voice.

But my own temper was up now. Slow to arouse, I am like an erupting volcano when I get started, and Taman's insulting epithet anent our origin had made me furious. Before Sarro guessed my intention I swept him out of my way with my manacled hands, leaped to the foot of the dais and faced Taman.

"Yes, I do defy you and your council!" I shouted. "And if it were not for your age, I would drag you down from that chair, and thrash you within an inch of your life for your insulting remark!"

"Bully for you, uncle Ned!" Teddy cried enthusiastically. "That's the way to talk to these big-heads"

For a moment or two our, no doubt unprecedented, defiant action appeared to paralyze everybody in the room. Then Sarro and his two aides grasped us and dragged us forcibly away from the dais. Manacled as we were we could not offer much resistance, even if it had not been for the Kras of our three guards.

Taman's face was awful to behold in his wrath.

"Never in the history of our race has this sacred council chamber been so defiled!" he thundered. "You have not only defied the supreme council of Raa, but you have also threatened with violence the sacred person of the governor. That, and your attempt to escape to the surface has earned you the double death, to which I now condemn you!"

He swept his flaming gaze over the members of the council on both sides of him. "What says the council—does the sentence of the governor fall or stand?"

There was a very brief interchange of words between the two groups of councillors. Then the nearest one at Taman's right rose and bowed to him reverently.

"The judgment of the governor stands forever!" he announced solemnly.

When the leader at the left had gone through the identical ceremony, Taman turned to us once more.

"You two felons have heard the august decision of the supreme council," he said harshly. "Have you anything to say?"

I drew myself up to my full height of six feet and five inches, and faced him intrepidly.

"Yes, most assuredly I have something to say," I replied loudly. "I utterly condemn the sentence as absolutely unjust and cruel! A cowardly injustice exercised upon two helpless strangers in an alien land, where no redress for them is possible!"

"And that expresses my views exactly!" Teddy

shouted aggressively.

"Enough! enough!" thundered the governor in awful wrath. "Take them to the worst part of the mines, and let them suffer the double death!"

CHAPTER XIV

Few Regrets

WITHOUT the least ceremony Teddy and I were roughly hustled out of the council chamber into the courtyard, where a surprise awaited us. Amidst the large throng of expectantly watching people one of the large, bird-like flying machines had been landed, towards which our energetic guards propelled us quickly.

So far, Teddy and I had seen these curious vessels of the air only at a distance, and naturally, despite our unenviable state of condemned prisoners, we were both very interested upon perceiving that we were to travel in one of them. Unlike our airplanes at the surface, this vessel of the air was equipped with movable wings, four of them, of indefinable material, and evidently collapsible. Its crimson-colored, long-stretched body reminded me of a swallow, and was indicative of considerable speed, while at the extreme front just below its neck were two large round lenses of crystal, evidently observation windows.

But I had not the time to observe more, for we were now urged up a narrow outer stair, built neatly into the side of the graceful vessel, and stepped onto its topless upper deck, where our guards immediately ushered us into one of the long, bench-like seats which ran athwart its almost entire length. But before we seated ourselves I observed, far forward, the rail-encircled opening of an inner stairway, and rightly judged that it led into the machinery and control department below.

Two of Sarro's men seated themselves in front of us, and two behind, each of them suggestively armed with a Kra. But I was secretly deeply thankful that the arch fiend himself was not to go along. Because, somehow, the very presence of the man irritated me, and I had reason to believe that he affected Teddy even more so.

We had barely seated ourselves, when a gentle trembling went through the airship, and we heard the rapid beating of its great wings. The next moment, without the least jar, the great mechanical bird rose quickly from the ground and ascended into the air at a steep angle. And with equal rapidity the great white pyramid and the other immense buildings surrounding it sank downwards out of sight, until nothing remained visible but the ever fascinating, many little suns, in the hazy blue abysses far far above us.

"Well, it seems we're in for it now, Teddy," I commented ruefully. "I don't mind so much about myself. But when I think that but for my wild scheme of penetrating the earth you would now be enjoying yourself back home, instead of losing your young, promising life by some unknown, horrible death—well, it makes me feel like a murderer, that's all."

With a clinking of his chains Teddy swung around to me, and I was amazed because of his cheerful, almost careless smile. Of necessity, on account of the manacling chain at his wrists, he placed both hands affectionately upon my arm.

"Cheer up, uncle Ned!" he said consolingly. "We're not dead yet by a whole lot. Many things are liable to happen between now and our last breath you know. Besides, I never would have forgiven you if you hadn't let me in on this adventure. So let's forget all about death, and enjoy our trip. Do you notice how silent this airship operates? Quite a difference between it and our noisy airplanes, isn't it? I am determined to find out how it works, and if we ever get back to the surface, I am going to build one."

"Which might not at all be a successful venture," I said dubiously. "Do not for a moment forget the great difference in air density between here and the surface. And then there is the question of driving power. These people probably have something along that line which might not be at all obtainable on the surface."

Teddy was thoughtfully silent for a few minutes. Then his face brightened, and he spoke triumphantly:

"But say, uncle Ned—you have apparently entirely forgotten the significant fact that, according to the electronic records, the Primarians were using similar vessels to these on the surface, two millions of years ago, before they ever emigrated to this land. Why, in the name of Jupiter, couldn't I do what they did?"

"You've got me there," I admitted smilingly. "However, it's just possible that two millions of years ago the atmospherical conditions on top were somewhat different from today."

With that both of us relapsed into reflective silence; Teddy no doubt dreaming about the fascinating Noama, and I listening to the resonant voices of our conversing guards, and to the droning of the great wings that carried my nephew and me to our doom.

Presently I was conscious of the fact that the conversation of our rear guards had stopped abruptly, and a peculiar sound, like a deep, shuddering sigh caused me to turn my head and glance at them. Certain that I was suffering from temporary delusion, I stared incredulously, and then nudged Teddy. Those glassy eyes and rigid bodies—no, there could be no mistake—in some inexplicable manner the two guards had been paralyzed by a Kra!

Rescued!

HOW, in the name of wonders, had this amazing thing happened?

But even while Teddy and I were yet staring at the two paralyzed men, there arose from somewhere behind them a head, entirely covered by a sack-like mask of crimson with slits for eyes, followed by a gloved hand. The hand made a quick Raanian sign of silence to us, and then it and the masked head sank out of sight as mysteriously as they had come.

That sign of silence! Could it be possible?—

Tremendous excitement gripped me as we turned our faces to the front again and waited tensely. It had all been a matter of seconds, and the two guards ahead were still conversing animatedly, not having noticed anything amiss; their own voices, the noise of the wings, and the rushing of the heavy subterranean air past the speeding vessel destroying all minor sounds.

A few moments passed. Presently, with the silence of shadows, two masked and winged figures of men on hands and knees crawled into the comfortable space between our seat and the one in front, and advanced towards us, one from each side. From one hand of each the cold glitter of a Kra flashed its ominous message.

The masked intruder on Teddy's end reached his objective point first. Inch by inch the deadly Kra in his gloved hand rose towards the neck of the nearest guard. But just as the weapon was about to leap the short remaining distance, the comrade of the threatened man saw it out of the corner of his eye, and shouted a strident warning, leaping to his feet at the same time. But he was too late. The Kra had found its mark, and the touched man stiffened into helplessness. Turning at bay, and with his own Kra ready, the sole remaining guard made ready for battle. But at that instant a heavy net dropped over him from the air above, enmeshing him helplessly, and a touch from the weapon of one of the marked men rendered him inert.

I glanced upwards, and to my astonishment perceived that directly above us hovered a small, slender airship, evidently traveling at the identical speed of the huge prison ship. A comfortable-looking ladder of metal dangled down from it, and up this our two masked rescuers urged Teddy and me, following immediately after us.

The instant we were aboard, the small vessel dropped behind the prison ship, turning in a sharp bank, and sped back towards Raa, which was already barely visible in the distance.

The airship which had so opportunely rescued us was evidently a private vessel, an air yacht; its graceful lines and luxurious deck arrangement attested to that. But our two masked friends immediately hustled us below by silent gestures, where another surprise awaited us:

In a small, ovoid-shaped room in the nose of the yacht—the control room—two other masked and winged men were menacing the two operators, and were evidently controlling the vessel through them.

By means of an amber-colored liquid, which dissolved the metal like hot coffee dissolves sugar, our two rescuers removed our manacles, and then helped us into wings, possibly those of the two operators of the airship. It reminded me of a pantomine, and I had a curious sense of unreality. Who were these men? I wondered. And why were they rescuing us?

But I had not time for speculation. Because no sooner were we equipped with the wings, than we were again led to the deck, and our two mysterious friends conducted us immediately to the flattened tail of the vessel. Without an instant's delay they started their wing mechanism, motioned for us to do the same, and without further ado hopped off into the void, signaling us to follow them.

Teddy did so with evident zest; but I had a peculiar, unpleasant feeling at the pit of my stomach as the force of my wings carried me smoothly off the tail of the airship, on the trail of my three companions. As I passed on I glanced behind me, and saw the other two masqueraders rise from the deck of the vessel, and fly in our direction. Then, accelerating my speed by a twist of the control knob on my chest, I caught up with Teddy, and we flew on abreast, following our two unknown leaders over the scattered houses and wide gardens and orchards of the outskirts of Raa, where a multitude of workers were busy among the plants and flowers, paying not the slightest attention to us.

But now the two masked flyers ahead of us began to rise upwards at a steep angle, until we had reached an air level far above that of ordinary wing travel, and much higher even than that used by the great airships. Evidently our two leaders believed in "safety first."

"Quite a lark, isn't it, Uncle Ned?" Teddy remarked, as we were flying level again. "But I wonder what became of our other two friends? I don't see them anywhere."

I glanced back. He was right, the other two masked flyers had disappeared.

"This flying might be a lark to you," I said, answering his first remark. "But it's a confounded nuisance to me. Give me the ground for comfortable traveling every time. And as for our two vanished friends: I think that the general idea is to scatter as much as possible. After all, I have an idea that a bold rescue like ours is not a matter of everyday occurrence. No doubt there will be an awful hullaballoo about it, especially when our particular friend, the high and mighty minister of police, Mr. Sarro learns of it."

"Great Jupiter's whiskers! I'd like to see Sarro's face when he hears the news," Teddy cried in malicious glee. "I bet he'll spit a ring around himself."

When we had arrived above the center part of the great city, our two silent guides dived downward again, at an acute angle, and it quickly became evident that their objective was an immense frustum of an octagonal pyramid, which reared its colossal bulk in the middle of an exceptionally spacious and luxuriant garden of magical beauty. A few minutes after our toboggan-like descent, we landed on the spacious roof of the rose-colored pyramid.

We did not tarry on the roof, however. For without a moment's delay our two guides, whose comparatively small stature I now noticed for the first time, hurried us down a broad stair to a large, octagon-shaped hall. One of them immediately disappeared through one of the seven or eight doors; but the other, who had been the real leader through it all, pulled off his sack-like mask, and turned to us smilingly.

For a few moments both of us stared at that smiling face utterly dumbfounded. Teddy was the first to find his voice.

"Great Jupiter—it's Noama!" he cried almost breathlessly.

With an even greater delight than his amazement had been, he caught one of the blushing girl's hands in his own, and pressed it fervently to his lips. "You wonderful, spunky little girl!" he said with deep feeling. He had both of her hands now, and even if she did not understand the words themselves, she could not very well misunderstand the sound of fond endearment in his voice as he said them, nor the tender light in his shining and admiring eyes.

But if my nephew's eyes expressed his tender senti-

ments, those of the girl fully reciprocated. "Tedde-e da-a-r-ling, I love you," she crooned in English.

Naturally, this amazing, open and unmistakable declaration on Noama's part in our own language dumbfounded me momentarily. Until I remembered that during Teddy's and my convalescence at the jail, the girl had secretly defied her grandfather's commands, and had visited with my nephew every day. It was now quite evident that my energetic young relative had utilized his opportunities fully, and had not lost any time in teaching his beautiful visitor the American way of making love in the modern and approved whirlwind fashion, with the appropriate words and gestures. It was likewise obvious that Noama had proved an apt and willing pupil.

Nevertheless, the granddaughter of the ruler of the land was anything but giddy-headed, and did not for a moment forget the danger of our precarious situation. Taking Teddy by the hand, she quickly led us to a door situated just behind the stairway, glancing once or twice apprehensively towards the elevator shaft in the center of the hall as she did so. Only when the door had closed behind us did she seem to breathe easier.

CHAPTER XV

Noama Confesses

"HOW, in the name of wonders, did you do it, Noama?" Teddy asked with keen interest, when we were comfortably seated, and equipped with sets of Sonaa. "You must have anticipated the sentence that your grandfather gave us."

"I did," she admitted. "And then too, Sarro, guessing my love for you, I suppose, allowed no occasion to pass without trying to torment me by telling me what he intended doing to you when he got the chance. Unwittingly in his passionate jealousy he told me just what I wanted to know, and accordingly I laid my plans."

"With three devoted friends, who owe their lives to me, I commandeered the vessel you saw, waited beyond the city, high up, for the coming of the prison ship, and then two of us landed on it. You know the rest."

"You are wonderful!" Teddy praised enthusiastically, and possessed himself of her unresisting right hand, which she blushingly allowed him to kiss and fondle. "But if you had failed? Or, worse yet, if your grandfather should find out what you have done—what then?"

Noama's beautiful face appeared to become momentarily strangely harsh when she answered:

"In the first case I would have followed you to the mines, and would have awaited my chance to rescue you from there. But as far as my grandfather, the governor, is concerned—if he should find out what I have done, it would mean death! No citizen of our land, no matter how exalted his or her station may be, can interfere with the august decisions of the supreme council and live. It is the law!"

Teddy gazed at her in an attitude of reverent worship.

"And yet, knowing all this, you took that awful chance, darling," he said in a tone of mingled love and reproach. "Why—why, I would rather die a dozen deaths, if that were possible, than to have harm come to you through me."

Noama smiled at him lovingly, and patted his cheek affectionately.

"Then, if you feel that way about me, Tedde-e da-a-r-ling," she said softly, "do you not understand that it is but natural that I should feel the same way about you, and that I should be cheerfully willing to risk my life when yours is in jeopardy?"

They were splendid, those two fine young lovers, in their simple readiness of self-sacrifice for each other, and I endured as much as I could of their utterly clean-souled, frank, and unconventional love making; but finally, in sheer self-defence, I felt it incumbent upon me to remind them that I was still present—a fact which both of them seemed to have utterly forgotten.

"Just what are your plans regarding Teddy and me, Noama?" I inquired rather diffidently. "Pardon me for asking; but naturally I am rather anxious to know."

She turned to me then, and gazed at me as if she was just awakening from some beautiful dream. She smiled happily.

"Oh—yes—of course," she agreed, drifting back again to reality. "You see—" turning to Teddy again, "I judged that the best thing to do under the circumstances would be for you two to stay right here, until the governor and Sarro come to the conclusion that you have escaped to one of the other eleven cities. After that we will watch our chance and escape to the upper world by the secret way which, long ago, I discovered by chance, and of which I alone hold the secret."

"We—?" Teddy asked incredulously, as if not daring to hope that he had heard aright. "Do you really mean that you—" he ceased as if unable to go on, and waited breathlessly.

She smiler, blushing, and her beatuiful, large eyes were like pools of clear, sacred fire as she gazed at him with all her love revealed in them.

"Of course, Tedde-e da-a-r-ling," she said softly, looking radiantly beautiful in that moment. "Of course I am going with you to your land. Is not the place of a bride with her lover?"

Without a word the utterly happy husband-to-be drew the marvelous girl into his arms then, and I escaped precipitately into the adjoining dining room, where I began to satisfy the insistent demands of my stomach with the plentiful and select viands provided.

Great Plans

I HAD finished my leisurely meal, and was just contemplating whether or not I should begin all over again, when Teddy entered the dining room. His face was all aglow with great happiness, and he slapped me affectionately on the back, so that I almost swallowed a new kind of fruit I was trying tentatively.

"Great Jupiter!" he cried in an exuberance of joy. "I feel so happy, I could embrace a four hundred pound nigger mammy!"

"No need of trying to kill a fellow about it, is there?" I grumbled peevishly. "And I'd rather have you do that hugging stunt than me. Seems to me you're getting rather expert along that line."

He colored right up to the roots of his copper-colored hair at that, and slapped my back again. "Be nice unkie, and don't grouch," he begged grinningly. "How's lunch? I'm as hungry as an eskimo."

"Oh, is that a fact?" I said with mock sarcasm. "Well, well, that is most surprising indeed. Seems to me I've read somewhere, or heard, that a soul in love nourishes itself on love alone. At any rate, all poets say so, they tell me, so it must be so. That being the case, I can't understand why—"

"But it's the soul—the soul only—that feeds on love, remember that little fact, uncle o' mine," Teddy interrupted me laughingly. "But the poor, mortal body requires more substantial food. For instance, a nice porterhouse steak, done just right, with plenty of smothered onions on top and—"

"You go to thunder!" I growled outragedly, and viciously attacked my seventh plate full of odds and ends.

Presently Teddy stopped with a fork-full of salad halfway to his mouth, and grinned at me mysteriously.

"By the way, Uncle Ned—I'll bet you a dozen pairs of new socks, you can't guess whose house this pyramid is."

For a few moments I stared at him wonderingly. Finally I shook my head. "No, I haven't an idea. Why? Whose is it?"

"Listen then," Teddy began with mock grandiloquence, "and I'll tell you the secret: We happen to be the house guests of Taman, the Thrice-Wise, governor of Raa, and chief justice of the supreme court! Now what do you think of that little piece of news?"

"Go on—tell me another one," I said sarcastically. "That one is too big to swallow. Give me something easier."

"Sounds like bunk, doesn't it?" he said with sudden gravity. "But it's true as the gospel, nevertheless. Noama told me just before she left. And she also explained why she brought us here—it's logically the only place in Raa that would not be suspected to harbor us. Furthermore, this part of the palace is never used now, and there is no possibility of our being discovered by any of the servants. One only besides Noama knows about our presence in the palace—one of her ladies-in-waiting, her personal, intimate friend; the unknown who was with her during our rescue."

"Well, by Jonah!" I said dazedly. "I feel like Daniel in the lions' den; but without his faith of invulnerability." Then, after a few moments of thought; "But that astonishing girl is right. They would never dream of looking for us here. I am forced to admire your taste, Teddy. There is more in that young woman's head than feminine nonsense."

"She is wonderful!" he said enthusiastically. "And that isn't all: She is going to bring us wigs which will not only camouflage our hair, but make our heads look bigger, and she will give us a sort of make-up cream that will disguise the color of our bodies, and make us look like natives. She said these things would be necessary in case we had to make a quick getaway."

"She is quite right," I agreed. "But how about the language? We would have to play dumb and deaf, I suppose."

"I don't think so, Uncle Ned. Because, when we were still convalescing at the jail, Noama and I got to talking about language, and she said that the Raanians had an arrangement whereby their children learn things while they are asleep. It's a process of absorption of knowledge by the subconscious mind, if I understood her right, and she intimated that at the first favorable opportunity she would get a set of the instruments and teach us the Raanian language in a few days. I'll ask her about it when she comes again."

CHAPTER XVI

More History

SOFTLY, so as not to awaken Teddy, I rose from my couch, tightened the sash of my sleeveless, kimono-like house dress, and passed from the darkened sleeping chamber to the front room. The long sleep had refreshened me, and I felt the need of food and entertainment. In the pretty little dining room, with its brightly tinted walls, I found a substantial and satisfying lunch, which our good fairy had provided while we were asleep, and then amused myself in the front room by examining the fixtures and the furniture.

One curious apparatus intrigued me almost immediately. It was a large and substantially built easy-chair, from the high back of which hung a large, and evidently adjustable ovoid of shining metal. On each arm of the chair were several knurled knobs. Full of curiosity I seated myself in the chair, pulled the ovoid down over my head like a diver his helmet, and waited. Nothing happened. My right hand touched one of the knobs on the chair arm, and I gave it an experimental twist.

Immediately the soft strains of string music, unlike any I had ever heard, sounded most pleasantly in my ears, and at the same time a picture took form before my eyes—the life-like, moving picture of a young and beautiful girl, unmistakeably a Raanian, who appeared to be standing upon a sort of pedestal, playing with nimble fingers on the strings of a harp-like instrument. Presently she began to sing in a marvelous contralto voice, and I realized that in some magical manner I was actually witnessing a theatrical performance, which was happening somewhere in the great city.

A touch of a hand on my arm startled me. I quickly shut off the music and vision and pushed up the big metal cap.

Teddy was standing by the side of the chair, gazing down at me anxiously.

"Do you know you gave me quite a jolt, Uncle Ned," he said. "When I was coming out of the bedroom and saw you sitting here so still, and with that big diver's cap over your head, the thought flashed into my mind that it might be a sort of electric chair, and that you were dead."

"Wrong, Teddy, my boy," I said laughingly. "Your old Uncle Ned is still alive and able to kick like a healthy steer."

When I had explained the machine to him, he naturally had a try at it, and was as enthusiastic as I was. Through experimenting we discovered that we could get almost any kind of music or vocal rendition, and decided that it was a sort of super-radio and television

machine. In each case the naturalness and reality of voice or sound, and of vision was so perfect that we appeared to be right on the spot where it was produced. But after an hour or so of musical entertainment we began to tire of it.

There was an electronic recording machine in the room, quite similar in appearance to the one we had used at the jail, but profusely ornamented, and of evidently finer material.

"What say we try that recording machine, Uncle Ned, and find out what happened to those interesting Primarians," Teddy suggested.

"Now let's see—" I mused as we were seated in front of the apparatus. "We have already seen three epochs of Primarian history; and therefore, if I set this dial to the fourth division, we should get the consecutive period. Well, here goes."

Teddy pressed the white starter button, and then both of us placed our faces to the padded, oval openings and stared into the black interior.

* * * * *

Once again we viewed that peculiar, golden-green phenomenon of luminosity which had accompanied our other three visions of Primarian history—

The luminous haze thinned. And then gradually a great disc of brilliant radiance pierced it, its light so bright that it taxed my eyes to their uttermost. I had the sensation of gazing upwards at it. And suddenly I understood: That great disc of white fire was the sun!

But it seemed an alien sun—somehow, in some indefinable manner, menacing. It was at its zenith apparently, but it bulked as large as one ordinarily sees the evening sun, when it is about to sink below the horizon.

Suddenly I experienced a strange sensation. I seemed to be turning a slow somersault in the air, and as the brilliant disc of the alien sun disappeared upwards, a great grassy plain appeared below me. There was something familiar about the place, and the view of a group of flat, extensive buildings obliquely down from my point of vision immediately reminded me that I was gazing at the great terminal of the marvelous twin shafts which led down to the new, subterranean home of the Primarian race.

However, there was now a new factor in the scene which it had lacked when I had last viewed it: A perfectly circular border had been formed about the great plot of ground occupied by the buildings, and from this radiated in perfect symmetrical order row upon row of countless thousands of ovoidal huts, or tents. They were of all colors of the rainbow, and, like the houses in the great city which I had seen, the colors and shades were all grouped apart. And through the streets and avenues thus formed, and in the air above them, I saw the ceaseless motion of myriads of people in many-colored garb.

The Great Cataclysm!

OTHER thousands and tens of thousands were arriving constantly through the air from all directions, like great swarms of migratory birds, carrying bundles that were doubtlessly personal belongings; and the varied coloring of wings and clothes, together with their constant and variable motion, made a wondrous and bewildering spectacle. It was doubtlessly the momentous time of their emigration from their old home; for on the ground an infinitely long line of people, four abreast, were passing slowly and orderly into the vast terminal building, through the side entrances of which a likewise constant string of the strange, curved passenger vehicles entered, being transported from the surrounding buildings on specially constructed carriers.

The vision passed into the great building. A scene of intense activity was revealed. Gone were the thousands of vehicles which the former period had shown, they being no doubt already dispatched on their long voyage to the new, subterranean land with loads of emigrants. Instead, the immense building was now literally crowded with a multitude of people of all ages, who were moving in an endless stream towards the shaft of departure. There, under the supervision of a corps of police guards they boarded the continually incoming passenger conveyers, and were immediately whisked out of sight into the yawning entrance of the great, winding shaft.

And presently too I noticed with great interest that from the shaft of return at the other end of the terminal occasional empty conveyers began to emerge, back from their trip into the bowels of the earth, indicating that the stupendous transportation chain was about completed, and that now a continuous line of moving passenger vehicles spanned the more than fifty thousand miles composed of the two tremendous shafts.

I began to study the people then—a robust, muscular, and healthy-appearing race, on the average larger and stronger than people in our world—and found that they behaved very much like modern people would have acted under like circumstances. The majority of the older ones were sad and thoughtful, no doubt realizing that, even if the earth were not destroyed, they would never again see the light of the golden sun, nor the blue sky above them, nor the flashing of the sunlight upon the emerald waters of the sea. But the younger people and the children evinced no sign of sadness or regret. Instead there was the joyous spirit of adventure and the eager anticipation of unknown experiences manifest in their flushed faces, and expressed in the impatient haste with which they flung themselves into the vehicles when their turn came.

But suddenly, through the tumult of embarkation and uproar of countless voices, I became conscious of a more strident clamor outside. A group of wild-eyed, pallid young men rushed in through the main portal, hurling people and children to left and right, and making their impetuous way to the mouth of the embarkation station.

"The sun has exploded!" they yelled shrilly. "The sun had exploded! Save himself who can!"

A scene of indescribable violence and ferocity ensued, as with one accord the thousands surged towards the mouth of the entrance shaft, and other frantic thousands were endeavoring to get in from the outside. In a moment, as it were, an orderly people had become wild, raging beasts, urged on by insensate fear and the primal law of self-preservation. They surged over the armed guards as if the latter had never existed, children were crushed to death, women were trampled under-

foot, men tore each other's flesh with their bare hands, and above all sounded the soul-sickening anguished screams of the maimed and dying.

Presently the vision passed from that scene of frightful savagery and death to the open again. Once more I seemed to look up into the heavens and beheld the strange, alien sun. But now its appearance had changed utterly. Its size had increased to enormous proportions, and it shone with unendurable brilliance. But the most striking feature about it was the radiations from its entire periphery—stupendous jets of blue-white fire that seemed to reach out to infinity. And even as I watched the tremendous celestial display in utter awe, the sun's disc was blotted out, and its dagger-like radiations merged into a cloud-like phenomenon of blinding light, which rapidly covered the entire heavens.

I guessed what was happening. Despite the precise calculations of the wisest of the Primarian wise men, and his prediction based upon this, something had gone wrong, and the explosion of the sun had happened prematurely, and was now hurling from its vast surface in all directions an immense mass of white-hot gases, traveling at a speed of many thousands of miles per second.

An unspeakable terror gripped me as I visualized what would happen when that awful cloud of destruction would engulf the earth. Presently I became conscious of an utterly dreadful, blood-chilling sound, coming from below.

The vision changed again to the great plain. A frightful change had taken place in its appearance. For, where before had been green grass and flowering bushes, there was now nothing but brown and black spots and blotches horribly suggestive of annihilation and death. And as I stared appalled, I perceived in utter horror countless thousands of indistinct, human shapes, crawling—crawling—crawling—

And then suddenly everything disappeared in a hell of blinding, stabbing flame!

CHAPTER XVII

A Horrible Calamity

HOURS later, when Teddy and I were still discussing the awful cataclysm we had witnessed, Noama paid us another visit.

She had made herself amazingly, wondrously beautiful.

A most artistically embroidered, short-sleeved house dress, rose-colored and satiny, and of many folds, enveloped her perfectly modelled figure almost to her graceful ankles; while embroidered slippers, of the same color and sheen as the dress, adorned her small, arched feet. A narrow belt, formed entirely of diamond-like jewels, drew the folds of the gown closely to her slender and supple waist; while a small round cap, fashioned from the same kind of scintillating gems, crowned the long, wavy tresses of her silken, dark hair, and completed the frame to a picture of feminine loveliness about which poets might well go into ecstasy.

Her large, starry eyes passed lightly over me, and their tender, warm gaze fastened itself upon my favored nephew.

"How do you like me in this dress, Tedde-e da-a-r-ling?" she fluted coquettishly.

"Like you—!" Further words evidently failed him; for he sprang up and pressed his lips to her right hand in silent, fervent adoration.

But suddenly he stared in turn at Noama and at me, with astonishment written large in his face. "Great Jupiter! Don't you notice something very strange, uncle Ned?" he questioned almost breathlessly.

For a moment or two I stared back at him puzzedly. Then his meaning struck me, and I realized a marvellous, inexplicable fact: Noama had spoken to us in her native tongue, and without a set of Sonaa, and we had understood her every word!

I answered Teddy's question with a silent nod; for I was quite a bit dazed, and then both of us turned questioningly to our beautiful young hostess, who seeed to be hugely enjoying our amazement. Her musical laughter rang through the room like a perfect chord.

"I think, Tedde-e, that both you and your uncle are doing quite well after but one language lesson," she said laughingly. "Your mental capacity of absorption, and your power of recollection appear to be very superior."

"Language lesson?" Teddy showed his utter astonishment. "But I don't remember taking any lessons. What do you mean, Noama?"

Whereupon that amazing girl explained that, by means of the teaching machine of which she had already spoken to Teddy she had given us our first language lesson while we had been asleep, and evidently our subconscious mind had absorbed her teaching perfectly.

But, wonderful as the process was, we had yet merely acquired the most rudimentary knowledge of the simple Raaian language, and needed a number of additional lessons. Therefore, in order to carry on intelligent conversation, we had to resort to the helpful Sonaa again. We told Noama that through the record machine we had witnessed the awful catastrophe which had overtaken the luckless Primarians in that long-past age of the earth, and desired further information on several points regarding that terrible event.

Noama's beautiful face had become very sad.

"It was indeed a most horrible calamity for my unfortunate progenitors," she said in a low voice. "I have often witnessed those last awful moments in the record, and it always shocks me dreadfully. The writings, and also the vocal records which have come down to us teach that fully seven-tenths of those poor people were in a few minutes completely annihilated on that terrible day."

"But, Noama, how was that record taken, dearest?" Teddy asked with deep interest. "Surely no sort of apparatus could possibly have endured in that solar furnace."

"That was not so difficult, Tedde-e, when you know that the chief of the Primarian wise men was the inventor of the wonderful Zanoon, as he himself indicated verbally in the earlier record, if you remember. All these records have been taken by means of the Zanoon, in combination with an electronic absorption machine. You must understand that long before the date set for the immigration of the Primarians into this

their new land, all the scientific instruments had already been transported down here, and set up in the great white pyramid, where you saw them, the temple of knowledge, as the Primarians called it. And many of the scientists were also already down here when the premature explosion of the sun occurred. Of course there have been many improvements added to the Zanoon since then; but the principle is the same. The inventor of it, the greatest of the Primarian wise men, also perished on that awful day."

"But there seems to be an inconsistency somewhere, Noama," Teddy said thoughtfully. "Because, how, in the name of wonders, could it have been possible to take the records of primal life long before the appearance of man on the earth, as my uncle and I saw it in the record machine?"

Noama's Story

NOAMA smiled at him tolerantly.

"That is a bit of trickery, in a way," she explained. "You see—after the cataclysm with its annihilating fiery gases, which burned up about half of its original diameter, the earth, at least its surface, was practically in the same condition as when it was first formed. But, of course, the cooling, and the consequent forming of water and land was infinitely more rapid.

"From generation to generation then, through the thousands and tens of thousands of years, the wise men of our land watched through the Zanoon the gradual cooling of the surface, the forming of the water and the new land, and the appearance of plant life and animal life in their order. Thus, the record of primitive animal life which you saw ahead of the record of Primarian life, was taken during the formation of the second earth. Quite logically the wise men calculated that the primal conditions of the first earth must have been about the same."

"That was indeed a most logical conclusion," I agreed readily. "What a wonderful ancestry you have, Noama —what wise men and sages. It's a pity though that the wisest of the Primarian wise men made such a grave miscalculation, with such awful consequences."

"But that terrible cataclysm was not due to a miscalculation, my friend," Noama corrected me gravely. "It was caused by some strange interplanetary force which suddenly greatly accelerated the speed of the oncoming swarm of meteors to such a degree, that it struck the sun very much sooner than expected."

"Tell me, Noama—" Teddy began gently, "did any of your people ever try to get back to the surface?"

"Yes, twice. When the second earth had fully formed and the era of reptiles, together with adverse atmospherical conditions had passed away, the council of wise men decided that the time was ripe for a pioneering attempt to repeople the surface. By means of simple calculations they had long before discovered that the thickness of the earth's new crust intervening between this land and the surface was only about one sixty-second part of the original thickness. Therefore the upward trip, which was to be made on foot, would not be at all difficult.

"In a very short time a corps of engineers had placed the air-ducts and lights of the remaining lengths of shaft in order, and had ascended to the top of it, to remove the molten rock masses which sealed its entrance. Only one of the shafts could be used; because by means of the Zanoon it was found that the mouth of the second one was under water.

"When everything was in readiness, the supreme council selected five hundred thousand young and hardy people of both sexes, among whom were all trades and professions, to form the pioneers of the new race which was to be established on the surface. As leaders they were given one hundred eminent scientists and wise men, and one governor, a member of the supreme council, to guide them all.

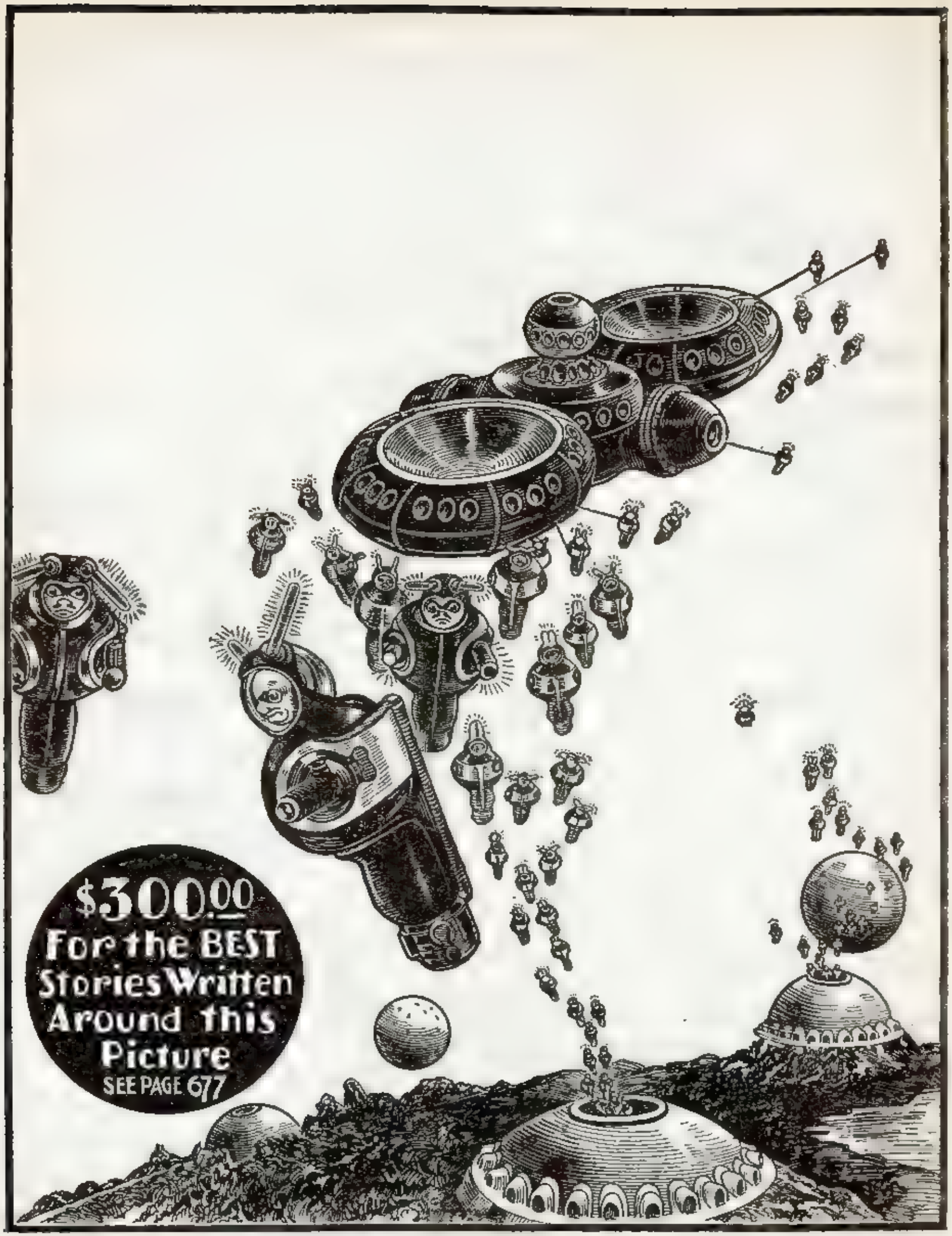
"Equipped with merely the most necessary utensils, the great army of pioneers ascended to the rocky and barren island on which the shaft terminated, and made ready for their long and perilous journey. Far, far in the direction of the setting sun from the island, the wise men had discovered an immense continent, rich in vegetation and animal life, and this was the object of the journey. But between stretched a great ocean, whose storm-whipped waves hurled themselves thunderingly against the cliffs of the island, while above them vast and black cloud masses lowered threateningly, as if about to pounce down upon those venturesome children from the subterranean world

"Many there were among the pioneers, especially the women, who were secretly terrified by this noisy and hostile new world, and who longed to get back to the silence and tranquility of their subterranean home. But they were of a brave race, and kept their thoughts to themselves. Specially large and powerful wings had been made for each of the pioneers, and at a given signal they rose into the air like an immense swarm of birds, one hundred thousand of them at a time, and followed their leaders in that long trans-oceanic flight, to a new life and to the many unknown dangers of a new and wild land.

"The remaining millions of people kept themselves informed of the progress of the pioneers, of course, by means of the Zanoon. Suffice it to say that, with the exception of several hundreds of unfortunates who, for one reason or another, fell into the ocean and drowned, the great army of adventurers arrived at their new home-land in good condition, and began their new life with zest and vigor.

"At first, under the fatherly guidance of the governor and their wise men, the pioneers jointly overcame all the thousands of difficulties and dangers confronting them, and formed one united and happy people. And so promising did conditions seem, that another five hundred thousand immigrants from here joined them during the first hundred years."

(To be Continued)



From this picture, used as the cover of the February 1930 issue of AIR WONDER STORIES (now merged into WONDER STORIES) the prize stories were to be written. We see the strange-looking men, encased in some metallic suits, rising in hordes from metal spheres in the ground. They have established some sort of communication with the strange-looking ship. In the distance float two heavenly bodies—suns, or moons or planets.

$300.00 PRIZE CONTEST

FEBRUARY 1930 AIR WONDER STORIES

Mr. Miller is a student at Union College, Schenectady, N. Y., and is a "collector" of science-fiction themes, culled from his studies and from general conversations.

FIRST PRIZE $150.00

Awarded to

THE RED PLAGUE

By

P. SCHUYLER MILLER

302 So. Ten Broeck St.

Scotia, N. Y.

A LOW, circling range of crumbling red cliffs hem in a tiny valley in the heart of the desert—a pale green speck in a sea of red sand. At their base, a great cavity in the cliff-face gapes black, set about with little black and red cubicles of baked mud or sheet iron. The valley is a scant half mile in diameter, a dot lost in the red waste, but in its center rise tall slim domes of silvery white, two hundred feet or more in height and a fourth as much in diameter, reflecting the blinding rays of the setting sun. About their base clusters a little, restless smudge of black, ebbing and flowing about the three broad vanes and interset jets of each great machine, resting on the base of white concrete that fills the center of the valley. High above, in the cloudless sky, a scattered swarm of gnats drone dully through the flickering haze beneath the deep blue heavens, where already dozens of stars are rivaling the brilliance of the setting sun.

Darkness, spangled with silver and set with gems of blue and red and gold, falls suddenly, with no blaze of twilight, over the crimson desert. In the little cubicles near the cave, in many of the tiny black openings of the silver towers, lights blink into being. From the valley floor rise circling shafts of light, white or golden or red, that bathe the silver towers and stab up and up into the star-spangled night. From their bosom, the droning gnats are spiraling down to the valley floor, to spew forth lesser blots of black figures that join the silent throng in the center of the valley, now drawn back from the base of the three silent domes of white metal.

P. SCHUYLER MILLER

WE print herewith the winning story of the February, 1930, cover contest from AIR WONDER STORIES. *The contest closed on March 5, 1930 and at the date over 500 manuscripts had been received. We are quite proud of the winning story, "The Red Plague"; for from a point of excellence of style, intensity of narrative and general tenor of the story, "The Red Plague" is one of the best stories we have received since the inception of our magazines. The receipt of a story such as this justifies amply our desire to interest amateurs in the writing of science fiction and if Mr. Miller can continue the same high level that he has set, he has a promising career ahead.*

Our readers will agree, we believe, that the use made of the cover picture was quite ingenious. Mr. Miller was evidently determined to escape from the old war theme, which occurred to most of the contestants. The whole story in fact, rings with originality. If there be a criticism, it is with the interpretation of the scene. The moons of Mars—Deimos and Phobos—would not appear as large as shown on the cover. They would in fact be quite small as seen from the surface of Mars. Therefore some of the stories which pictured the two objects in the background as a double or binary sun, were really more scientifically correct. But the other features of "The Red Plague" were sufficient to overcome that objection against it.

The second and third prize winning stories will be printed in the succeeding issues of WONDER STORIES.

Far off on the horizon a single gem swims into view in the sea of black, a glowing ruby, blazing steadily against the velvet darkness. Somewhere, a gong strikes once, a low throbbing beat of golden sound. Silence falls over the restless throng of black mites. Again it rings, dull and muffled as from far below the surface of the ground. In answer comes a blinding blaze of golden flame, veined with crimson and shot with silver, and on its heels a shattering blast of sound that starts little trickles of boulders on the face of the cliffs. And after it comes a fine intermittent piping that is lost in the silence of the desert. Above, three dots of red flare into incandescent white and vanish. Below, three towering domes of silver are gone from the concrete center of the little valley, where the splotch of black is thinning, spreading out into the darkness, and the drone of gnats has risen once more.

So a wandering deity, roving carelessly through space in the neighborhood of an especially insignificant little sun, might have witnessed the going of Man's three hopes out into the uncharted, untried sea of space, leaving their little planet Earth to seek charity and brotherhood from an alien race who must have solved

the problem that was wasting away the life of the planet. As is the way of such minor deities, his interest might have been aroused by this puny onslaught of a race of mites, and he might hesitate in order to tamper mischievously with the wheel of Fate, balancing Success against Death in an eternal instant of indecision, then tossing down his choice and going his way, just a little bored, to create a sun or crush a solar system.

Ten long years before, a nameless aviator, crossing one of the less dangerous deserts of western North America, woke to the fact of his imminent destruction with a rude start as a scorching mass of incandescent metal hurtled past him into the blank white sands, throwing aloft a geyser of powdered rock and sand, and bringing him fluttering to earth in flames. When, nearly a week later, rescuers found him gnawing his last sandwich and shying pebbles at the still hot meteorite, a few noticed that immediately around it the sand was red, and crumbled queerly into dust, while the moisture in their bodies seemed to be sucked out by the abnormally dry air. The meteor was small, and buried deeply, and nobody gave it a second thought until it forced the knowledge of its presence upon the entire world.

That year, prolonged drought made the crops in a rather isolated section of Arizona fail, but nobody cared, with the exception of a few half-breeds and an Indian or two, who depended upon them for a livelihood, and a queer old cuss with long whiskers who made millions from a mine a hundred miles or so to the north, and who raved for months because his prize roses shriveled in the sun.

Two years later, the crimson sand reached the nearest of the regular tourist stations, where another "queer cuss" with a yellow walrus mustaache and a couple of degrees was hunting for a meteorite which nobody had ever heard of. Then the world woke up, and wondered why something wasn't done about it all.

It took "Swede" Hansen just two weeks from the time when he left his canteen of water unstoppered for ten minutes in the shade of a red rock to the time when he found his meteorite—and the source of the Plague. In another fortnight the place where the thing had fallen resembled a cross between an airdrome and a university. By the end of the third year, the entire understanding population of the planet knew what had happened, and what in all probability would happen in all too short a length of time.

To be brief, the meteorite, the same which had brought down the aviator, had also brought to Earth from some place far outside the limits of the solar system that dread scourge which man knows as the Red Plague. It had one new element in it, radioactive, placed by the chemists beyond Uranium, which must needs have been formed under conditions strange enough to warrant its properties. This element was the catalyst, the carrier, so to speak, of the Plague. There were also certain unknown compounds of the most inert of the known elements, which, in the presence of the new *Galactium*, constituted the Red Plague itself.

As Hansen very soon discovered, once given the clue of the empty canteen, the Red Plague meant the eventual and rapid withdrawal of water from the list of Man's resources and necessities. These new compounds, apparently as indestructible as their parent elements, attacked all silica and aluminum rocks. Activated by infinitesimal amounts of *Galactium*, which was readily soluble in them, they attacked rock and soil of almost any sort, reducing it to a crumbling crimson sand, which in turn pulverized to a fine red dust of nearly molecular dimensions and consequently of enormous surface. This either sand or dust, had practically infinite powers of adsorption for water.

The Plague Spreads

WITH this huge available surface in even the smallest mass of dust, and with the additional properties which amounted to the unprecedented and inexplicable phenomenon of chemical magnetism for water, any moisture that came anywhere this red menace was immediately and completely adsorbed onto the surface of the dust. Valid physical and chemical tests proved that the water was adsorbed rather than being absorbed into any pores or used as water of crystallization. The stuff spread like wildfire, the fine gold dust going its deadly way on every gust of hot dry wind, and in no time the leprous red scabs festered everywhere in the northern half of the western hemisphere. Water could not be used to lay the dust—indeed, it *must not* be so used, for to Man and to all the living creatures of Earth water is Life.

Scientists of every race and sort, led by the tireless Hansen, worked endlessly over the dust, searching for anti-catalysts, searching for solvents, searching for anything that might save America's water, or regain that which had already been lost. For no man could remove from the dust that water which it had taken to itself Electrolysis, indeed, broke the water into its component hydrogen and oxygen, but in the vicinity of the radioactive catalyst they instantly recombined to form water, giving a beautiful and expensive explosion but nothing more. So electrolysis, and with it the entire field of electricity, was foolishly abandoned. And so the vain work went on.

Five years passed, years of toil and isolation and knowledge that death was not far off for America. In the face of the peril to the world, Europe and the rest of the nations of the planet kept a strict embargo upon immigration. Commerce was strictly one-sided: water poured from all the world into America—at a price. Everywhere were the blackened vegetation, the shriveled bodies, the empty river beds, and the dry red scabs of the Red Plague. And still Hansen labored tirelessly, with all the millions of old Ephraim Cutter, the mine-owner whose roses had withered and died, at his disposal.

Then, with the coming of the fifth year, panic broke over the world. For, whether from winds, from birds, or from other, smaller meteorites, or even, as many hinted, deliberately spread by inhuman fiends, the Red Plague burst over the planet from pole to pole, and Death stared Man in the face. Science had found that the Plague did not of itself sink far beneath the surface of the Earth, and, consequently, every day found more frantically digging men and women, striving to bury themselves blindly in the supposed safety of the Earth's heart. Soon this seemed the only refuge, and govern-

ment by government, the world sought the isolation of great Man-made caverns deep in the earth. And then a young astronomer announced that it was the dust of the Plague that colored Mars!

Every eye was turned to the cloudless, blue-black skies, star-flecked even in the daytime, where Mars swam low. Madness came, frenzied curses, for many believed that it was from Mars that the meteorite bearing the Plague had come. But Science led through to sanity, showed that such a thought was ridiculous and impossible, asked why Mars should visit destruction upon a planet which might save it from a like fate. And Science showed hope, for Science knew that even as our own polar caps of ice were fast waning, and snows no longer came nor vegetation made green the river valleys, so the polar caps of Mars were *growing,* year by year, creeping in toward the red wastes of the equator, outlining the mysterious "canals" with deeper and broader green as time passed. *Mars was conquering the Red Plague!*

As the dust of the Plague spread over the Earth and outlawed traffic upon its surface for fear of carrying the dread red dust to some untouched spot, Man had taken entirely to the air. From the broad roof-fields of every towering city, from little farms and great factories, from ocean liner and man-made floating island rose numberless ships of the air, carrying Man about his business. In a short five years the few great continental air-lines had spread over all the world. Not long since, Man had feared the air, feared to leave the surface of his planet and entrust his life and safety to Science. Now, Man feared the ground! Atomic energy became available in part, albeit at great expense, and now every man paid his government for the energy which kept him safe above the plague-infested surface of the Earth.

With the news of the young astronomer borne by the news service to every corner of the world, Man revived again the dreams of those days long before the Plague when scientist and layman alike struggled with the thought of leaving this little Earth and speeding, in great shining rockets, out into empty space, to other planets, other suns, other universes. And with the world at his back, old Ephraim Cutter turned his failing millions from the fruitless battling of the Plague to Man's last hope—a great, threefold leap into space, in an effort to enlist the peoples of Mars in the service of a helpless Earth. Three great rockets of strong, light *durium,* built by the master engineers of the world, driven by the energy of the broken atom, manned each by a crew of six experts, would drive up into the night from the still-green oval of Cutter's Hole, up and up until at last the red deserts of Mars should be beneath, and the solution to Man's problem should lie before the three ships of space, to be won or lost forever.

Rising at first slowly, then ever faster, until the broadening bowl of the Earth changed to a floating ball of bloody green, the three rockets sped upward and outward, glowing from cherry red to incandescent white with the friction of the atmosphere, then cooling in the absolute zero of space with a suddenness that set the sorely strained metal hull into a bedlam of creaking as it cooled. Only superb workmanship in the making of the great ships kept them from bursting under the enormous tension. In each, five men sweated and strained under the terrific heat and acceleration—men who had been trained for five long years to withstand these very burdens. Before the master control-board, sunk in the heart of the ship where no harm might come to it, sat the commander of each rocket, eyes strained to the televisor and the many dials of the board, beside him food capsules and the sleep drug, that he might work for three Earth-days without relief—in the first of the three, "Swede" Hansen. Five hundred miles of space separated the three great rockets, surrounded by the luminous golden haze of their exhaust gases, but in the televisor each commander stood side by side with his fellow, bristling Swede, burly spectacled Negro, and clean-cut athlete from Annapolis, guiding, by word and touch and gesture, their silvery ships of space. They were forgetful of the telescopes on mountain peak or desert plateau that searched the skies for three tiny fleeting shapes with the glory of the sun reflected from their shining metal sides.

On the Way!

AT the little barred windows of heavily-wired quartz, the men of the crew gazed wistfully at the green the blue globe, etched with familiar outlines and splotched with scabrous red, that grew ever smaller behind. Now and again the voice of their commander would ring from the speaker in the wall, his gestures on the great screen direct them, and they would sink panting to the floor or flounder helpless in their hammocks while the great after jets poured forth golden vapor and the starry heavens reeled and spun before the enormous acceleration that drove them ever nearer to their top speed of one hundred thousand miles an hour. For an instant, far behind in the black of space, two silver specks drove on and on along the unmarked trail that Man followed for the first time. Then the rolling thunder of a jet would shake the ship and the swinging heavens sweep them from sight. A strange and thrilling experience for these erstwhile masters of the air, now become navigators of empty endlessness.

Ahead, the Moon loomed dead and bare, its pocked and pitted face swelling into a wilderness of crater and jagged crag and bottomless crevices, blanketed in the dense white volcanic dust that once spewed from the thousands of great volcanoes of a living world. Then, with the passing of the day on the chronometers, its pear-shaped bulk swung past barely a million miles below, and three little specks of silver light hurtled on into emptiness, half a million miles with each five hours.

"Swede" Hansen slept less than any man in that leap through space. On every ship were five men beside the master, each fully capable of handling the ship for a day or a week, gauging with trained accuracy the change for any slighest deflection of the course, holding to the thin silver line on the space chart, representing a leeway of many thousand miles (the line ran straight from green curve to red against the polished black) watching the pressure, the fuel, the air, the radiation rate and temperature, doing all the thousand and one things, great and small, that navigation by dead reckoning in open space must entail. On all but the flagship of the

little fleet, each man took his turn of three days, so that with the last watch, at the end of the third week, each commander should take his post to maneuver his ship through the atmosphere of Mars to a safe landing. But in the leading ship the bristling yellow moustache would appear in the televisor, the blue eyes twinkle, and the jolly voice boom in the speaker.

"Hallo! How you takin' it, over there? Tell your lazy captain that the girls should be sunburned to suit his taste in color, on Mars!" Or else—

"Hallo! You there, on number three! Where's your commander—writin' love letters or playin' football? Tell him he's a thousand off the median, or else I am."

And they would come to the control room of their ships, the great bulky Negro with his perpetual grin and horn-rimmed spectacles, and the college man with a dream in his smiling eyes, and josh back at him, or send little meaningful messages from man to man of the crews.

"Hey, Swede!" the athlete would shout. "I dare you to come over and wrestle me, you big soft lump! Who called you a scientist, you blamed old walrus? If you don't chew off that fringe of bristles, right pronto, I'll send a little meteor over to clip 'em for you!"

"Never mind my whiskers, young fellow. An' don't sass your commander-in-chief, or he'll have you marooned on an asteroid to cool off. Say, kid, tell Frenchy there, your radio man, that Bill got a whale of a picture of Eros the other day when we passed it. He says he can make out water on it, but it takes pretty good eyes to make out the mountain ranges. Beat that if you can."

Or the Negro, Johnson. He talked rather slowly, but moved like lightning at the controls, and always spoke in a serious tone that belied his flashing grin and the way in which he ignored his spectacles.

"Oh, Cap'n Hansen, we're havin' a little mite of trouble over here, with the vision apparatus, and our radio man has the willies from stayin' awake too long watchin' the stars. I sort of thought you might know something about it. It's been a-flickerin' off an' on, sort of like a loose connection somewhere, but we don't seem to be able to find it. I'd appreciate it a lot if you would sort of think it over some time soon, an' let me know what your idea is."

"*Say,* Johnny, where d'you keep your brains when you're off the controls? Didn't you tell me not more than a week ago that you'd moved the blamed thing up near the generator? You've got a hole in your screenin' some place, an' the generator's just naturally raisin' Old Scratch with your field."

"Thanks, Cap'n, thanks a lot. You know that I'm not just dumb, but there's a heap of sunburn to weigh me down, like you have with that shoe-brush of yours. I'll see you later when we fix the vision up a bit better."

A pleasant trio, good friends, great men and great scientists, companions to their mixed crews. And then, two weeks out, a frantic call came from the control room of the steadily decelerating ship that sent "Swede" to the board on the run with every man on edge and at his post. There was no time for more than a nod and a brief "Hallo!" to his comrades, each in his place with a grim set expression on his face. Out of space, directly in the course of the onrushing ships, a huge, widespread swarm of meteors plunged directly toward the three tiny silver specks. They could not stop, or diverge widely, could not survive the sudden acceleration of the change. At the terrible speed with which they were approaching head on the scattered cluster of iron and stone giants, any collision must be fatal, and the only chance must be to plunge through the thinnest part of the swarm, deflecting where possible, and trusting to God for the rest.

On, on, into the maelstrom of hurtling star-fragments, the smallest of which could deal destruction to any of the ships, and hence to an entire planet, the first rocket sped. "Swede," every sense on edge, every muscle tense, hovered over the controls. Here, half a mile meant life or death. A rushing bulk in the screen, the whirl of a dial, the rattling thunder of a jet, a sickening lurch, and safety—repeated in terms of seconds, with miles of crowded space in every swerve!

Again and again, time after time, then a glancing blow from a mass of rock and iron the size of a basketball, that ripped the great armored plates off the side of the ship for half its length, destroying a vane entirely and driving a deep dent in the inner sheathing—then dart and dodge and through in safety! And within twenty seconds Johnson is in it, gripping his dials grimly, cold sweat on his shining face, strong white teeth clenched through a mangled lip! Swerve, leap swerve again, and then a blur of flame in the screen, a tearing of metal, and blackness! On the other screen a clean-shaven man grits his teeth and turns aside his straining eyes, then freezes to his work, his duty to Man. On, on, through flying masses the size of giant buildings, fragments of lost planets, swerving, darting, slowing, a master's hand at the keyboard and dials, thin lips set in a narrow line under the strain of the acceleration! Ten seconds, twenty, twenty-five, and the way is clear. He shudders, grins into the televisor at "Swede," then freezes in horror! His voice chokes in the speaker. "So long, you—damned—old—walrus—you!" In a flash he is gone, shattered by the great thing that hurtled in the wake of the swarm, or frozen instantly in the absolute cold of space. Perhaps neither was more than a hundred miles off "Swede's" course, the course of safety, a mere three seconds' distance, but in all likelihood ten miles would have been as fatal. It was four days before "Swede" Hansen took over the controls, to guide the slowing ship safely to its landing.

On Mars!

DOWN through the thin air of Mars, gliding in a long, flat spiral over the endless wastes of red sand through which jutted the crumbling remains of ancient peaks, the battered space-ship sank toward the surface of the planet, rising, become flatter, then suddenly concave. The canals were plain in the clear air, broad lanes of matted moss running mile on mile across the decayed red wastes, blending at the edges into the desert of crimson dust that swirls in great clouds over the barren wilderness. Here and there they converged, came together in great circular areas many miles across, where the crumbling rock that jutted up through the rank moss had strange, half familiar forms. Cities had been here, once. In some the moss was withering, the

lanes of green velvet thinning before the onslaught of the Red Plague. Near the equator, especially, was this true, where the shattered ship must land. To the north and south, where broad ice caps glistened white, it might be otherwise. Time must tell, would tell.

"Swede" Hansen, worn, haggard, the memory of his comrades deep in his eyes, struggled through the crumpled metal port of the mighty ship that had plowed deep in the sand, its vanes twisted and scored, the edges of the gaping slash in its hull fused by the friction of the air. After him came three men. Two had been in that part of the ship which was struck, and died of the sudden shock and compression which had dented the insulating armor and burst in an inner bulkhead. A few hundred feet away the moss began, an unhealthy metallic green. Above, opposite the blazing sun, swung Phobos and Deimos, the two moons of Mars—Phobos a scant six thousand miles above the planet, and Deimos, jerked from its former distant orbit by the most massive comet in the records of astronomy, which now rotated very near its limit of disruption, and was daily drawing closer to its mother planet. Neither showed any important markings, clouds of pumice and ash from long extinct volcanoes having buried all mountainous features of their surfaces, even as has been done on a less thorough scale on the Moon. Sunlight, reflected from the red surface of their parent planet, bathed them in an orange light.

Wearily the four men dragged forth the heavy cases which contained parts of the comfortable and roomy aero with which they were to explore this new planet. There would be more room, now, for food and instruments, with two men less, they thought bitterly. Then they withdrew into the ship, leaving an electrical alarm with the cases, for a much needed rest. Now that there was no longer danger of the storeroom collapsing on the aero, and leaving them stranded, the world and Man could wait for one more day.

When the sun set once more over the red Martian wastes, a new, lithe form lay beside the crumpled rocket, speed in every line of its marvelously designed frame. The engineers of Earth had striven long and hard to provide this most perfect of Man's aeros for the expedition. Of tough, shining metal and clear crystal, stream-lined with the utmost perfection, capable of circling the Earth in a day or less, no man of the remaining crew but was proud of the trim craft. And he who had designed her, young Jimmy Van Deusen, late of Boston, strutted grinning beside her, stroking the broad stubby wings and tail surfaces, testing the resilient landing gear, looking to the lubrication of the twin propellers and trio of helicopters, and at last, at a word from his chief, leaping to the pilot's cockpit for a test flight. The atomic motors purred sleepily, the helicopters began their crescendo whine, then with a flash of silver under the setting sun he was off, and up within fifty yards, the wind whistling over the clean cut body of the aero and setting up tiny whirlpools in the red dust. Up and up, until the vanished sun once more shone gloriously on the silver bird of Man, up until only a shining speck was visible, then down, mile on mile in a screaming dive that flattened out a bare thousand feet above the sands, and changed to a mad frenzy of loop and spin and roll, climbing, diving, whirling. Then, with propellers and helicopters reversed, dropping almost vertically to rest beside the great half buried hulk of the rocket. He tumbled out joyously.

"She's great, Swede!" he shouted. "With this atmosphere, and gravity like this—Wow! We're going to go places and do things with this little lady, all right, and don't you doubt it! Oh what a ship!"

"Good. We must not waste time. In the morning, early, we should go. Can we?"

"Sure! We could go right now, if we were packed. Let's stow everything away now, and beat the sun up."

So, with the rising sun, the little ship with its cargo of four eager men roared up in a golden mist of disintegrated atoms and flashed through the brightening skies to the southward, toward the greatest ice cap of Mars. As mile after mile sped by beneath, affording brief glimpses of ruined, crumbling cities and rotting red peaks, they saw with hope and joy that the green lanes of giant moss became ranker and broader, seeming to press out from the line of their flight into the red desert on either side

Then, far on the horizon, appeared a flashing, dazzling glory of light, the mighty antarctic ice sheet of Mars. Here was the great area over which a triumphant Mars had conquered the Red Plague, had redeemed her precious water, was doing so day after day. Here would be the Martians, skilled, intelligent beings, wiser than Man, who must be persuaded to share their secret with a sister planet before it was too late. An hour, now, and they would be there!

And with the passing of that endless hour, the green path had broadened into a mighty emerald carpet, leading straight to the base of the towering walls of ice that crowded down from the south. Rimming about the rampart of ice, separating it from the green of the converging lanes, lay water, a lake of cool, pure water, lying open and unharmed under the rays of the sun!

Then Jimmy noticed *them*, queer oblong ships that floated motionless above the edge of the narrow lake. Three were in sight, perhaps fifty miles apart and two hundred feet above the line where water and moss merged. More than the thin air and lesser gravity, these men of Earth had found it hard to accustom their senses and motions to the judging of distance on this planet of greater curvature, but comparison with more familiar objects later gave the necessary clue to their size and distance. The strange machines were about forty feet in length and twenty-five in width at the middle. They seemed to be made of pure gold. In a fifteen foot ring at each end was set a polished mirror of green stone, while above the tubular central body, which separated the rings, was a bulbous tower some ten feet in height. Everywhere were little windows of the green crystal, indicating that creatures of some sort manned the machine, though it was little more than ten feet in thickness. No other sign of life or intelligence was visible.

"Hey," said Jimmy hoarsely, "they must be pretty small, to man that. What is it, anyway, Harry? Got any ideas?"

"Certainly," replied the tall Englishman. "It seems to me to be plain enough that it is the thing that we are after, the apparatus that makes the moss grow and the

Plague fail. But where are the Martians? They can't live in those."

"Hover for a while, Jimmy," put in Hansen. "If they're there, they ought to see us and make their presence known. We can't afford to wait, and it won't do to make them our enemies. We will have to handle them with kid gloves."

The Examination

FOR nearly two hours they hovered, or circled the queer machine, trying to peer through the windows, but without result. Then "Scotty" MacRae, the third man of the crew, who had been roughly mapping the place, grabbed Harry by the arm and pointed below. The others, seeing the gesture, looked through the ports at the surface of the planet, a hundred feet or so below.

The thick carpet of moss was buckling upward in three widely separated spots, showing the red earth beneath, which was being pushed slowly upward and outward by some slow steady pressure from below. Then a polished dome of pink metal appeared, followed by two others, and rose with a slow rotation some thirty feet into the air, revealing a ring of hooded openings leading onto a narrow ledge that ran around the entire dome. From a large opening in the flattened peak, little red figures were swiftly rising toward the aero and the queer machine, on which they began to play bright yellow rays of some sort—human figures, five feet in height.

They approached the aero fearlessly, appearing now as suits of red and white metal with crystal head-pieces above which protruded luminous green horns. As the little figures sped upward or came to rest, these correspondingly came together or diverged, showing that by interaction between them and a force field of some sort these individual flyers were propelled. Where hands would have been, on Earth, twin pivoted ray-tubes were fastened.

One of the little flyers rose barely ten feet in front of the hovering aero. Others joined it. The heads of the Martians were visible through the crystal, ugly little creatures, but evidently enormously advanced. The head and face were bare and shiny, with large ears pressed flat against the skull, adapted for hearing in the rare atmosphere. The chin was small, pointed, and protruding, the jaw small, the mouth thin and expressionless. Great nostrils in a nearly vertical nose made it possible to inhale great lungsful of thin air with comparative ease. The black eyes, round and goggling, and sunk deep in their sockets, regarded the men with an indifferent stare.

Suddenly the nearest Martian flashed his yellow ray full in the faces of the group.

"Who are you?" came the thought. "What do you want?"

Hansen replied verbally, pointing to his lips to indicate that he could talk.

"Do not speak. Think. I have the ray on you. Our languages are not the same."

Each mentally pictured the history of their expedition, its cause, the fate of their companions. Hansen asked to see someone in authority.

"You are from the Third Planet. We have noted the coming of the Plague. We expected you. You will be examined. If you prove worthy, your race will be aided. If not, it is wisest that you perish. Leave your machine for examination. It will be returned, if you need it. Land, and follow me."

At a sign from Hansen, Jimmy brought the aero to the ground beside the nearest dome, and the four men left it to follow the Martian. He led them into one of the openings on the ledge, which closed, leaving them in the dark. Suddenly the floor sank, bearing them down into the blackness, then stopping short many feet below the surface. They followed their little guide into a vast, dim cavern, crowded with the little red forms of flying Martians, entered a long low vehicle that shot like a bullet through the narrow streets, the while emitting a high pitched wail. They came finally to a halt before a great windowless building of grey metal, surrounded by a wide plaza. Inside, they were shoved into a small bare room and left alone. The door, when they turned, was invisible.

Then, through a crystal oval in the ceiling, the yellow ray flooded every corner of the room. Standing there, helpless, they felt the probing questions of their examiners, pelting them with queries of all sorts, dragging every thought from their bewildered brains. They knew the futility of any failure to reply, and hence settled down to search their memories for every scrap of information that they might contain which would better outline Man's knowledge of the Universe. Now and then, when memories conflicted, the questioning took on a sharper, impatient note until the point in question was fully cleared. Once or twice, as they spoke of the atomic release that provided Man with energy, the questions were eager with the knowledge of a new, unsuspected truth. It was this power of Man to partially free the energy of the atom which proved his worth and his right to the air and brotherhood of the peoples of Mars, a race which, for all its greater age and triumphs in other fields, had failed utterly in this. At last the ray flashed out, and they sank on the hard cold floor in exhausted sleep.

Their former guide woke them, led them to an escalator, then left them. The moving metal belt rose steeply into the upper portion of the building, ran on through the dark and out into light, dim, but brighter than the outer caverns. The Martians, adapted by centuries of life to dimness, could not stand light such as they might easily have produced artificially, and when in their golden electrifying machines must needs use the green crystal to shield them from the sun.

Now, for the first time, they saw a Martian without his flying and protecting suit. They had slight, dwarfed forms, barely four feet tall, with huge chests and tiny legs. Their arms were short and thin, with large delicate hands and long, very slender fingers that seemed well on the way to the formation of tentacles. When they spoke, surprisingly enough, their voices were deep and grave, showing that their dwarfed size was due to no disease or physical defect, but to direct evolution under the cramped conditioned of under ground life.

Now the thought-carrying ray was focused on them once more, and from the ten greatest scientists of all

Mars they learned indelibly what the Martian government had decided to tell them.

Several thousand years before, when the Martians had not yet attained Man's station in life, a meteor bearing the Plague fell in the heart of the most densely populated portion of Mars, and spread red destruction over all the planet. Even as Man was doing now, they had buried their cities deep into the safety of the planet's heart, and there in the semi-darkness had developed the existing race, mental giants but physical dwarfs.

Always they had striven to combat the Red Plague, which had covered all the surface of Mars and was slowly eating its way toward their retreat. There, in their great natural and man-made caverns, they had discovered the motive force of the flying suits, and of all their flying apparatus. They had developed a crystalline substance so energized in a manner analagous to magnetism, that when like poles were brought together, they reversed the gravitational field over an area depending on their strength. When they lay in the same line, it was neutralized, and the flyer hung motionless, or drifted as the mechanism of the solar system willed. At any median angle, with reversed polarity, gravitation was amplified. The use of variations of this principle for nearly all extended motion led to the ultimate devolopment of their atrophied legs and feet, and the formation of slender, flexible fingers for manipulation of the keyboard controls common to all their devices.

Then, accidentally, they found that a very strong electric field would effect the rapid disintegration of the catalyst, our *Galactium*, to familiar elements, leaving the other compounds harmless except for any natural adsorptive powers of a dust so finely divided. Of course, if the soil were to be recontaminated by the catalyst, it would again become the former menace, but here it was discovered that certain mosses flourished in the newly reclaimed soil, and that they so altered the compounds as to make the catalyst impotent. Again, with the mosses removed, contact with the pure compounds would cause something like a change into the harmful forms, but this could be avoided, and moss-tracks were laid from most of the buried cities to the poles, where some water yet lingered, and reclamation began. Most important of all, the reclaimed soil was extremely fertile, and could be used in the synthesis of the energized crystal. The long, thin machines of gold were energy convertors, turning the radiation of the sun into electrical energy, and laying down the electric field that destroyed the catalyst. Already, the area of permanently reclaimed land had spread remarkably, and other plants were growing where the moss had cleared the way. These, with the frequency of the thought ray, were the secrets that Mars gave to her sister, Earth, and in turn the Martians learned the application of their devices to the liberation of atomic energy, somewhat more efficient than solar radiation as a source of power.

"That is all," concluded the spokesman of the Martian men of Science. "You will be given the moss. A space ship of our own type has been prepared for you. You may use the gravitors to repel meteors. You, of the Third Planet, Tellus or Earth, are better for physical strife than are we. Our minds are capable of greater comprehension. Let us henceforth share our knowledge, that together we may succeed where one race should soon fail. We will not leave Mars, for we are physically unfitted for the strain. It will take thousands of years to change us, for we are an old race. Meanwhile, come and go in peace and welcome. Tell us of the Universe, which we may not see for ourselves. Be our bodies and our senses, and we will aid your minds. Farewell!"

The manipulation of the new ship was easily learned, though quickness on the unfamiliar keyboard control came hard to men accustomed by long practice to switches, levers, and dials. Soon Mars was shrinking behind the spherical space ship with its great projecting rods of crystal at top and bottom. Then space once more opened before them, and closed once more behind as the white phantom of the Moon flashed past, and Earth at last spun below.

Everyone knows the result. The Martian moss flourished, and, crossed with plants of our own, proved more effective than ever. The unsuspected value of the red earth has been quickly taken advantage of in many fields, and the crimson wastes are taking on a new appearance. Within the year, a second expedition will set forth into space, carrying the new plants to Mars, solving the shrouded mysteries of Venus, reaching out beyond the asteroids to the major planets, whose larger satellites may harbor life. The thought ray breaks down the barriers of race between all thinking beings, and it seems certain that at last the dreams of the ancient writers are to be realized in a union of the planets in knowledge and peace.

THE END.

ADVANCE OF SCIENCE

By THE PLANET PRINCE

From the dark, medieval ages
  Comes the infant tread of Science
Stumbling soft as if in wonder—
  Seeking courage, self-reliance.

But its pace grows quickly firmer
  And its step becomes a stride
With its measured march resounding,
  Keeping pace with Human tide.

Now it travels even faster
  Roaring like some rampant soul
Surging, leaping, stronger, vaster—
  Howling like some demon goaled.

Blinding, searing, it darts onward
  At an untold, timeless rate:
Crowding, forging ever faster,
  It's an avalanche of Fate!

Science, whither is thy journey:
  What inferno is thy goal?
Will your rush be ever checkened
  Or your story ever told?

Whose Flight Was the More Hazardous

LINDBERGH'S or BYRD'S?

RESULTS OF THE PRIZE CONTEST

SOME months ago, we received a letter from a Pittsburgh, Pennsylvania schoolboy, Nicholas Marcin, asking us to tell him who in our opinion had the more hazardous flight, Colonel Lindbergh in his hop over the Atlantic from New York to Paris on May 27, 1927 or Admiral Byrd in his flight over the South Pole. Mr. Marcin stated that his school science club desired earnestly the answer to this question. Believing this subject to be of great current interest to not only Americans but the world at large, we inaugurated a prize letter contest in ARE WONDER STORIES, offering a prize of $25.00 for the best letter on the subject.

The returns in this contest exceeded by far our expectations, and in fact we were pleasurably surprised at the tremendous interest in this question. All told 5,593 letters were received. Of these 3,008 believed that Lindbergh made the more hazardous flight, 2,460 favored Byrd's and 125 stated that there was no appreciable difference between the two.

The prize letter is that of Mr. John Randolph, of Pompton Lakes, New Jersey, which is printed herewith. The editors were impressed by the scientific spirit with which Mr. Randolph approached the problem, contrasting so greatly with the haphazard guesses and "feelings" of so many of the contestants. Mr. Randolph saw clearly that a general answer to the question was impossible without analyzing the various factors that made up the hazard; and he did this so well that we are sure our readers will agree in our choice of the first prize.

The next best letters, entitled to honorable mention, were those of Edward Mowbray Tate, 1128 John Jay Hall, Columbia University, New York; and Maras Serriov, Box 801, Palo Alto, Cal.

The text of the prize letter follows:

Editor Hazardous Flight Contest,
WONDER STORIES,
98 Park Place, N. Y. City.

To compare the hazards faced we should consider the *known* causes of accidents.

The Navy's analysis of cause of all air crashes for eight years charges: A—52% to "human element"—personal failure of pilot. B—31% to structural or motor failure. C—17% to weather and miscellaneous.

A—If the flyers are equal in technique, judgment, caution, nerve and stamina, then this greatest hazard must be judged by the comparative number of consecutive hours each pilot must endure to reach safety.

Railroads and employers have found that every man's alert efficiency decreases after sixteen consecutive hours and that after twenty-four hours the mind lapses into a condition of numb, semi-consciousness and involuntary and unrealized naps causing wrecks and accidents.

This condition is intensified by continuous noise and by being alone; and is cumulative in its effect.

This fact alone suffices to prove that Lindbergh's solo flight, with its many hours beyond the ordinary point of human endurance was more hazardous than any other successful flight over a course with no emergency landing place.

B—In case of forced landing account causes either A or B, Byrd and party might have reached the ground unhurt. He was on a known meridian, he had matches, alcohol and concentrated food; his scout planes with their sun compasses to follow his course could succor him. Had Lindbergh been forced down in mid flight his position would have been more hazardous.

JOHN RANDOLPH

Mr. Randolph is 45 years old, and the poet of Pomptonia. His vocation is a laborer—his avocation a poet, naturalist and philosopher.

C—In long flights with no emergency landing fields the weather is important: There were planes as good as Lindbergh's and more famous pilots than he, waiting for *less hazardous* weather at the time he started his flight.

Byrd had many safety devices and improvements which were not available to Lindbergh at the time of his flight.

Byrd used the Sun Compass and could hardly lose his course by accident in the clear, dry, polar day, while the variation of the Mariner's Compass is so erratic on a passage from New York to Paris that its eccentricity is a hazard to any pilot's first trip over the course.

In case of severe storm, fog or deviation from the expected course, Byrd had fuel enough to fly a few hours longer than his estimated trip. Lindbergh's fuel-excess margin was much less.

We, who understood the conditions and the hazards which confronted Lindbergh at the time, can assure the boys of the School-Science Club that

1. Had "Lindy" been suddenly incapacitated on the morning of his flight, *no* other famous flyer would have volunteered to take his place and attempted to make the flight that day. Not even Admiral Byrd.

2. Had Admiral Byrd been incapacitated on the morning of *his* attempt and there had been a dozen of the country's greatest flyers on the spot they would *all* have jumped at the chance to fly in *his* place because there was a reasonable chance for success and in case of failure *a reasonable chance for life*. Summing up all the factors, I believe Lindbergh's flight to have been the more hazardous.

JOHN RANDOLPH,
Pompton Lakes, N. J.

The various answers received were quite interesting, and by a summary of the points made in favor of each contestant, our readers will clearly perceive why the great majority favored Lindbergh in his flight rather than Byrd. The editors wish to state however, that they are not attempting to make any estimate of the personal qualities of the two outstanding figures of modern aviation, nor are we attempting to estimate the value of their flights to the nation or the world. We have the greatest admiration for both of them, and believe that Lindbergh has shown that he is capable of being the calm, calculating scientific solver of aviation problems; while Byrd's courage and dash mark the man just as his organizing and executive abilities do.

Points Endangering Lindbergh's Flight

1. His youth and inexperience.
2. His aloneness, with no relief pilot.
3. The duration of the flight (33 hours against 19 by Byrd).
4. The previous failures and precedent against success.
5. The bad weather.
6. The lack of an emergency landing place on the trip
7. The motor hazard (a single-motored plane, while Byrd's was tri-motored).
8. The lack of reliable instruments and radio.
9. The lack of adequate preparations (as contrasted with Byrd's).
10. The lack of surplus fuel.

Points Endangering Byrd's Flight

1. The lack of accurate maps.
2. The lack of help nearby should the plane fail.
3. The danger from unseen, uncontrollable forces such as blizzards, unseen mountain peaks, etc.
4. The extreme variability in the weather.
5. The lack of a definite landing place under known conditions.

The Bat-Men of Mars

(*Continued from page* 135)

terrestrial mass. Tor Floro was awed by the vast amount of ocean, for, in spite of the astronomical lore of Turinia, she had not realized there was so much water anywhere.

Dr. Fry was elated. The aim of the projectile for the Earth had been almost perfect. He cut out the gyroscope, however, as the Earth's mass loomed dead ahead and only a few hours distant.

Now the great shell entered the earth's atmosphere, and its speed was gradually decelerated. The Earth people were almost home, and with them was one who had gladly left another world to find happiness elsewhere. And that, Tor Floro had found in the devotion of her husband from Sjor.

In the distance loomed land and a city. Between lay the shimmering blue of the Pacific ocean.

"Ahead, Tor Floro," said her husband, "lies San Francisco, one of our proudest cities. In just a little while we shall be at home in good old St. Louis."

"Where they won't believe a word of what we shall tell them," wryly suggested Dr. Fry, "so perhaps it would be just as well if we told them nothing."

"But that would never do!" declared Randolph, who was much in love with the queenly Tor Floro. "We shall be compelled to tell the world everything! How else could Tor Floro be accounted for? For I am sure her like has never been seen upon the Earth!"

"Another statement like that," retorted his friend, the scientist, "and I shall insist upon your taking a sedative. You're getting excited!" But Tor Floro, from Turinia, repaid the gallantry of her hero husband from Sjor with a happy smile.

THE END.

The Flight of the *Mercury*

(*Continued from page* 121)

freezing if I stayed there very long, I again tried to get around the Martian, and this time it remained quite motionless, and I was soon running like mad toward my plane, my teeth chattering with the sudden and increasing cold. I dashed through the doors, slammed them shut and turned on all the heaters in the cabin. Then I prepared and finished a much-needed supper, and turned in for the night.

"You know, I've thought quite a little bit about that sudden change that came over the Martian world at sunset, and I've come to the conclusion that that sudden cessation of life corresponds to our sleep. But with the extremes of temperature, and the thinness of the atmosphere, the Martian sleep is a thing far more overpowering than ours, apparently just a sudden overwhelming unconsciousness that lasts until the next sunrise. At any rate, the next morning when I awoke, the sun had already risen, and on glancing outside, I saw that the Martian world was again its normal pale green self.

"I saw another thing, too, for directly outside my door squatted the globular Martian. It had evidently awakened and finding me gone, had hastened to the only place that its reason or instinct told it that it could find me. And when, after breakfast, I tried to leave the plane, I found the Martian just as determined to keep me in it as it had been the day before to prevent me from getting into it.

"Well, old chap, it seems absurd to admit it, but it was a stalemate! For three days, I remained in the vicinity, trying to elude the Martian, or at least trying to penetrate the mystery of it; but in the end I gave it up. I decided that that particular part of Mars was no place for me, and so I started the plane and left for parts unknown.

"But once I was in the air again, I went into a funk. I don't know whether it was the air, or my food or what, but I got into the worst spell of the blues that I'd ever had in my life. And it all ended in my turning the bus back toward the Earth! You see, I figured that this Martian game was just a little too much for one man, and that I'd better come back for reinforcements. And so here I am, back on the Earth, feeling like a Columbus that had turned back in sight of San Salvador."

He finished his narrative, refilled his pipe and sat smoking, thoughtfully.

"Anti-climax, what?" he said at last, "No princess rescued, no rebellion quelled, not even the usual guide to give an explanation of the wonders I saw. I feel no end a bally fool. I shouldn't have tried to do it all by myself. But I'm going back to London in the morning and get a staff of scientist Johnnies and trot them up to Mars and let them do a little observing. Then when we return perhaps we'll have a more interesting tale to tell, eh?"

He knocked the ashes out of his pipe and stood up.

"I won't impose on your hospitality any further, old man. I can sleep just as well in the cabin as I could up here, anyhow. So I'll just toddle along. See you in the morning," and he sauntered away. I watched his form as he walked away, and finally I, too, arose and entered my tent.

The next morning when I arose his plane was gone! I supposed, of course, that he had returned to London, and I watched eagerly for news of him. But even after my return to civilization, I heard nothing of him, and I have finally concluded that he never returned to London at all. I wonder—I just wonder if his curiosity overcame him and he returned to Mars? Or, perhaps, did he go to Venus?

THE END.

Science Questions and Answers

THIS department is conducted for the benefit of readers who have pertinent queries on modern scientific discoveries and on established scientific facts. As space is limited we cannot undertake to answer more than three questions for each letter. The flood of correspondence received makes it impractical also to print answers as soon as we receive questions. However, questions of general interest will receive careful attention. If you desire individual answers to your queries, enclose 25c in postage to cover time and mailing.

Gliders

Editor, Science Questions and Answers:

1. Please tell me if you think a glider training course would be of use if I intend to have an aviation career?

2. I wonder if you could draw a diagram showing some of the things on the Curtiss *Tanager* plane that helped it to win the $100,000 prize in the Guggenheim Contest.

William Donaldson,
651 Kellogg Street,
Grand Rapids, Mich.

(1. There is no doubt but that a glider course would be of great aid in an aviation career. "Gliders, and How to Fly Them," a book published by the Popular Book Company of 98 Park Place, New York, which has been on sale at all newsstands and can now be obtained from the publisher will tell you all you want to know of the theoretical and practical details. This book costs only fifty cents, and is the only one of its kind.

2. We are unable to print the complete plans of the Curtiss "Tanager" plane that won the $100,000 prize in the Guggenheim safe plane contests which closed last fall. But the accompanying photograph shows the plane and some of the details that won the first prize for it.—Editor.)

The Curtiss TANAGER plane—winner of the $100,000 Guggenheim Prize. Some of the features notably the automatic slots, the wing flaps and floating ailerons are shown.

What is the Fourth Dimension?

Editor, Science Questions and Answers:

Will you please answer this question for me? What is meant by the fourth dimension? I have read many stories about it but I do not seem to be able to grasp its meaning.

W. Johnson,
1419 East 54th Street,
Brooklyn, N. Y.

(In not grasping the meaning of the fourth dimension, Mr. Johnson has plenty of company—for there is really no established meaning for it. The three ordinary dimensions of anything are length, breadth and thickness or its location by means of its three distances from a fixed point. Now it is believed by many, by Einstein for example that it is not sufficient to describe an object by giving those three dimensions alone. Just as it is not possible to describe a solid piece of anything by merely giving its length. Einstein believes that an object's place in "time" is just as important, as its location physically. For example, a man wants to describe where a certain object is. He says, "It's in my apartment. My apartment is located at the corner of A and B Streets on the tenth floor." Now if he had said that his apartment was located on A Street on the tenth floor he would not have described it. He had to use three descriptions of location (called "coordinates" by the mathematician) in order to describe it. Now Einstein says that that description by three coordinates is still not complete but that the man must add a time coordinate; he must say, "My apartment is located at the corner of A and B Streets on the tenth floor on June 1, 1930."

That time coordinate is called the fourth dimension by some. Another conception of the fourth dimension arises in the following manner. We take a pencil and make a point on a piece of paper. Then we extend the point until we have a line. That line is said to have one dimension—it has only length. Now if we were to draw three more lines so that we have a square inscribed on the paper we have an object of two dimensions—it has length and width. Now if we were to pile papers one on top of each other the resulting pile would be an object of three dimensions. Now the scientists who speak of the possibilities of a fourth dimension say that by taking a three dimensional object and performing appropriate "tricks" such as I have described in making a line into a three dimensional object, it can be made four dimensional.

The difficulty with trying to "visualize" with one's eyes the fourth dimension, is that we are beings with three dimensional senses and we live in a three dimensional world. Any description then, of a fourth dimension, we admit is inadequate.—Editor.)

What is Gravity?

Editor, Science Questions and Answers:

There is something that troubles me about gravity. Could you explain to me in the clearest terms just what gravity consists of? Will it ever be conquered? What are your ideas as to how it will be done?

J. Claude Roby,
Lachute, Quebec, Canada.

(Gravity, explained simply, is a magnetic attraction between particles of matter that tend to draw them together, just as two magnets oppositely charged are drawn together. Matter, unless it is electrically charged with similar charges, seems to have that property of being attracted to other bits of matter. The attraction is strongest when the bodies are close together, and the further away they are the weaker it becomes. In fact the force is inversely as the "square of the distance." In other words if two objects are five feet apart and they are moved ten feet apart, they are twice as far apart and the attraction between them is only one-quarter of what it was. The attraction also depends directly on the mass [or amount of material] in the bodies. If they are large, the attraction will be greater, increasing with the size of the bodies.

Gravity is being conquered every day by heavier-than-air flying machines. So long as an airplane can maintain a certain minimum speed through the air it is defying the effort of gravity to pull it to the ground. But a nullification of gravity, we believe, will come by the storing up in the body to be nullified a certain amount of electric charges which tend to oppose the electric charges of the earth. The electric energy, of course, to nullify the gravity of a body and lift it, we believe will have to be just as great as if the gravity were not nullified. The advantage of gravity nullification is that no heavy fuel will have to be taken on the ship. All the work can be done on the ground.—Editor.)

Controlling Growth

Editor, Science Questions and Answers:

Can the growth of man be controlled by the pituitary gland? Will this method work on animals? What is the general method of operation? Where can I learn about growth control, as I wish to make a study of it?

Gallant Hayes,
419 Mass Street,
Gary, Indiana

The pituitary gland is located at the base of the brain, a little way behind the top of the nose. This gland is now clearly recognized as an organ controlling the bony growth of the body, both in length and width, and to some extent the growth of the soft tissues. When it is too active, we find overgrowth, which sometimes reaches the extent of giantism. The body becomes tall and lean, and the condition brings with it a tendency to high blood pressure and hardening of the arteries. Where there is a deficiency of the secretion, on the other hand, we meet not only a retardation of the skeletal growth but a strong tendency to obesity, a feminine type of figure even in the male, tapering fingers and a high-pitched voice. In extreme cases dwarfism results. The "fat boy" of the school is usually deficient in this secretion.

In the hands of trained laboratory workers the growth of animals has been regulated up or down by giving or withholding injections of extract of pituitary gland. Its use in the hands of skilled physicians has produced remarkable results in persons who suffer from rickets, softening or brittleness of the bones, and in cases of abnormal "fatness" of adolescence. Science is only beginning to learn the significance and importance of this gland. Needless to say, glandular extracts are not a thing for untrained experimenters to dabble with. No one who is not a highly trained specialist should ever attempt to play with so intricate and delicate a subject. However, anyone interested will find a good deal of information in the new (14th) edition of the "Encyclopedia Britannica," and in "Constitutional Inadequacies," by Nicola Pende (Lea and Febiger, Philadelphia).—Editor.)

IN this department we shall publish every month your opinions. After all, this is your magazine and it is edited for you. If we fall down on the choice of our stories, or if the editorial board slips up occasionally, it is up to you to voice your opinion. It makes no difference whether your letter is complimentary, critical, or whether it contains a good old-fashioned brick bat. All are equally welcome. All of your letters, as much as space will allow, will be published here for the benefit of all. Due to the large influx of mail, no communications to this department are answered individually unless 25c in stamps to cover time and postage is remitted.

Dead or Living Dead

Editor, WONDER STORIES:

Having just completed reading the May issue of SCIENCE WONDER STORIES, I decided to write a letter to you.

I feel that it is only an obvious thing, and needless repetition to say how much I like your magazine. So I will try to talk of other things.

I believe that the best story in the May issue is "The City of the Living Dead." Perhaps other stories in the issue were better from a purely literary standpoint, but, although a story is more enjoyable in proportion to the superiority of its literary style, I put this story first, because of the idea which was expressed in it. There has been one or maybe more stories along this general line, at least to some degree similar to it. But this one had a better idea, and expressed it better, than any of the others which I have read. Of course this is merely my own opinion, and many readers may differ from me.

It raises a rather interesting consideration, something similar to the often mentioned one of not being able to prove ourselves not to be inmates of an insane asylum. Assuming that all the senses were connected to this "record," as the story did, and assuming the record to be a most complex thing, how can we say that these "living dead" were any more "dead" than we are. Could they not be said to be alive, since they have all the senses which we do?

If a device similar to this, yet permitting a return to the normal state, should ever be invented, I imagine that it would become very popular. It would certainly excel any means of entertainment which we have now. If the records could be made sufficiently complex each person could live a "perfect" life—perfect from his viewpoint and his tastes. Too, he could probably do it in an hour, since the psychological time element could, probably, be controlled.

In your "Science News of the Month" I noticed an extremely interesting article, about the electron. It stated that the modern wave theory of mechanics now considered the inner construction of the atom to be a wave phenomena in 6 dimensions. Now, I think it would be very interesting to most of your readers, for you to print a short condensed article, giving the main conclusions which the modern theories have reached about the atom, electron, etc. Of course this should be published in as simple language as possible. At present the great majority of people can not get much literature on such subjects, because it is necessary to have a complete education in mathematics and physics.

Jack P. Sickels,
Lapwai, Idaho.

(Mr. Sickels is quite right in his idea about the living dead. After all, we know we are alive because of our senses and our consciousness. The living dead, therefore, immovable as they might be to us—are to themselves living intensely active lives—in fact they are, to use Mr. Sickel's words, "living completely." That is a state that we live people never achieve.

The question then arises. Suppose such a machine were invented to permit us to do what the living dead did. Should we take advantage of it, and forsake our normal life? We would welcome the comments of our readers on this very interesting question.

It would be very difficult, we believe, to explain the wave theory of mechanics in simple language. For it deals with conceptions that are to us purely mathematical. It is almost impossible to translate the mathematician's language into our own. However if we receive a manuscript that we believe covers the subject adequately, we may publish it.—*Editor.*)

Interplanetary Society Progresses

Editor, WONDER STORIES:

We have had so many requests for information about ourselves and how one may become a member that we offer the following.

The American Interplanetary Society is an organization of laymen and scientists, associated for the purpose of encouraging interest and research in interplanetary communication and travel. At present, meetings of the New York members are being held twice each month at the American Museum of Natural History in New York City, at which time papers or addresses on special phases of the problem are presented by members or invited speakers.

The Society already numbers in its membership such notable persons as Dr. Robert H. Goddard, the rocket experimenter, of Clark University; Dr. Clyde Fisher of the American Museum of Natural History; Captain Sir Hubert Wilkins, the explorer, and Mr. Hugo Gernsback, the editor and publisher. Other active members include engineers, technical men, writers, newspaper men, lawyers, physicians, business men and teachers of science.

The Society is assembling a library on interplanetary communication which will be the most comprehensive in America, to serve as a clearing house for information on the subject. It expects to issue an annual report, which shall be the result of a survey of all the available material on interplanetary travel, and to publish a monthly bulletin covering the news of the entire field of its activities. In these ways, members will be kept informed of all developments, and public enthusiasm can be stimulated to the ultimate end of sending projectiles to the moon or other planets.

The Society, by the raising of funds, and otherwise, also expects to stimulate research by American scientists on the problem, and to hold public meetings at which prominent authorities will be invited to speak.

Two classes of membership are open to individuals: active and associate. Active members are entitled to all the rights and privileges of the Society; the freedom of its library; a voice in the direction of its affairs and the holding of office. To mature men and women, therefore, the Society offers the opportunity to pioneer in the newest of all sciences and a chance to help bring to a reality the most stupendous adventure ever conceived by man.

The dues for active members are $10 per annum, payable in advance.

Associate members may attend all meetings, have the freedom of the library, receive all publications issued by the Society and otherwise enjoy all privileges accorded to active members except a voice in the direction of the Society. Dues for associate members are $3.00 per annum, payable in advance. The Society is inclined to limit active membership to men and women over twenty-one years of age, who have at least a high school education or its equivalent, and a sound knowledge of the sciences and the nature of the physical world.

The officers of the Society are: David Lasser, president; G. Edward Pendray, vice-president; C. P. Mason, secretary; Laurence Manning, treasurer; and Fletcher Pratt, librarian. Address all communications to the undersigned.

C. P. Mason, Secretary,
American Interplanetary Society,
302 West 22nd Street, New York.

(We publish this information about the American Interplanetary Society for the benefit of our readers. By all evidence the Society is destined to become a power in scientific circles as soon as the public awakens to its potentialities.—*Editor.*)

ON LETTERS

BECAUSE of the large number of letters we receive, we find it physically impossible to print them all in full. May we request our correspondents, therefore, to make their letters as brief and to the point as they can; as this will aid in their selection for publication? Whenever possible, we will print the letter in full; but in some cases, when lack of space prohibits publishing the complete letter, we will give a résumé of it in a single paragraph.

Phenomenal and Unbelievable

Editor, WONDER STORIES:

I have been reading AMAZING WONDER STORIES for the past eight months and I have found them pleasurable and instructive. But since my duties confine me to the house, I have to do all my traveling through your great magazine. It describes things so phenomenal and unbelievable in this age, one has to stop and wonder where in the world such intellectual men have been found to write such scientific realities.

I can never get enough of these stories. Such entertainment for a quarter was unheard of until I discovered your magazines. Who knows but that in the next age the miracles that are performed for us in your WONDER STORIES will be enacted in real life.

(Miss) Gladys Ambrose,
347 E. Roosevelt Boulevard,
Philadelphia, Pa.

(We think that Miss Ambrose has struck a great truth in our magazines. And that is that we all yearn to travel to far distant places, to escape for awhile the boredom of the sameness of our lives, and live in a newer and more glorious existence. And we ask ourselves, how can we do that and still remain here, as we must? Then the answer comes—through the imagination. For the half hour or hour that one is immersed in a gripping story of new worlds and new ages, he is really living in that new world and that new age. Science fiction then, we believe is a new method of transportation. Only the passage is made instantaneously both ways. We thank Miss Ambrose for calling this very interesting idea to our attention.—*Editor.*)

Einstein Again

Editor, WONDER STORIES:

It seems like resurrecting the dead to renew the argument about Einstein's theories, but I must correct your statement that the leading scientists accept them as fact. I believe that at a comparatively recent meeting of a fairly representative group, a decision was made in the negative.

If Einstein is correct, I give up. I can't see how gravity can be centrifugal force when such a solution would mean a trip in space for the poor fellows that happened to be on sides other than the leading or inner ones.

On the subject of gravity, why do all the writers insist on giving large bodies great gravity? We don't know enough about the force to adhere to the theory that they have in mind so steadfastly, especially in a science-fiction magazine, or rather THE science-fiction magazine—since the other seems to have decayed in ideals.

A suggestion: why not be ultra-unique and run a perpetual story, much as the newspaper runs comic strips. A number of these have plots worth following. With a good subject and a writer who can make things seem real—you

(*Continued on Page 182*)

THE GREY SHADOW

By W. F. Hammond

On All Newsstands

25c *The Copy*

A masterpiece of amazing detective fiction. A wealthy criminal employs the latest scientific inventions to hound the group of financiers which ruined his father. From beginning to end you follow the trail with Fiske Errel, the scientific man-hunter, until, by a stroke of brilliant reasoning, he destroys *The Grey Shadow.*

HORROR HOUSE

By Walter Livingston Martin

Your blood will run hot and cold by turns, as apparently inexplicable crimes follow one another in rapid succession. But science lights the path of the law—and the secret of *Horror House* is revealed at the dramatic conclusion to a story that is "different" than usual. A weird yet logical story of an amazing killer.

THE MIND MACHINE

By George Eugene Key

We do not believe that any story which has been published in the last few years so plausibly explains the scientific developments we may expect to be commonplace by 1950. A story of murder and crime in future years—clearly and excitingly narrated.

THE TOWER MYSTERY

By E. Zorbas

The victim of a ruthless girl disappears into thin air. Follow Detective Prawn's incisive deductions as he exposes an astounding crime.

THE MYSTERY OF THE PHANTOM SHOT

By Amelia Reynolds Long

A wealthy man is alone in his study. A shot is fired within the room—the man is found dead—yet no bullet has touched his body. "HOW? WHY? and WHEN?" are the questions you will ask yourself when reading this masterpiece of fiction.

And other stories of absorbing interest and excitement.

MAIL COUPON

AMAZING DETECTIVE TALES, WS-7
98 Park Place, New York, N. Y.

I wish to take advantage of your special offer. Enclosed is $1.00 for which please send me the next eight issues of AMAZING DETECTIVE TALES.

Name . . . . . .

Address . . . . . .

City . . . . . State . . . .

(Canada and foreign $1.25)

An Unusual Offer

8 MONTHS $1.00

By clipping the coupon at the left and mailing it immediately to AMAZING DETECTIVE TALES you will receive the next eight issues for One Dollar. This is much lower than the regular subscription price and you should take advantage of this offer NOW

THE READER SPEAKS

(*Continued from page* 181)

have quite a choice—I am sure the idea would "go over." It wouldn't be necessary to develop the plot much each issue, a couple of pages each time. It might be put in sketches as in newspapers. A "history" of the future would make a wearing subject. What do the others think?

Irving Houston,
Hartford, Conn.

(We are not aware that by Einstein's theories gravity is the same as centrifugal force. The only relationship that might have been brought out was that a planet is held in its orbit by a balance between gravitation [the pull of the sun on the planet] and centrifugal force [the tendency of the planet to escape from its orbit and go flying off at a tangent to its orbit]. Large bodies are assumed to have a large gravitation force because, everything else equal, they have a large mass and therefore a great power of attracting other bodies. The behavior of planets about the sun confirms experimentally or at least from a point of observation Newton's laws of gravitation. Until they are upset we can hold on to them as the best explanation for the behavior of matter.

The idea of a perpetual story is an interesting one—only we are afraid that if the story is exciting enough to deserve being perpetual, the strain on the nerves of our readers would be too great waiting for the next installment. However, it is worth thinking about.—*Editor.*)

"Hunches" and Time Traveling

Editor, WONDER STORIES:

At last I can write you to tell you that Wonder Stories is a very important periodical in modern literature. I wish the editors the success they deserve—which is quite a bit.

I would be glad to hear from any of your readers, at any time. Members of my family were early settlers in your land and also in Australia. I myself have come from England only recently.

Now about time travel stories. They may be possible. Even the recording of the future may be possible, despite what some of your critics say. For we do not record the past with our minds, but with definite instruments such as the camera and gramophone. But I had had several experiences in which I saw the future events before they occurred. We have what is popularly known as a "hunch." These hunches are worthy of the study of any scientist. I would be glad to get your reader's attitude on this, and their own experience with "hunches."

Sidney J. Starling,
c/o Post Office Narre-Warren,
Victoria State, Australia.

(Mr. Starling mentions a very interesting thing which already has much to be said for it. People have really claimed to have "previsions" of future events, and Camille Flamarion, the late noted astronomer, wrote a whole book on such experiences of people. Perhaps Mr. Starling is right, that when one has a "hunch" that he is getting a dim, vague but never-the-less certain glimpse into the future. After all there is so little that we know about ourselves, about our actions, our thoughts, our mental and psychic makeup that things quite startling may be revealed to us by future science. We would like to hear from other readers about experiences similar to Mr. Starling's.—*Editor.*)

Why Not a Ballot?

Editor, WONDER STORIES:

Would you kindly answer the following questions.

1. When will "The Martian Revenge" and "The Annihilator Comes" be published?
2. What is the price of back numbers of Science Wonder Quarterly?
3. Why don't you have a ballot on the serial question?
4. A few suggested improvements are: A reprint department; no Science News of the Month and having Paul as the only illustrator.

More sub-sea stories please.

James Lassiter,
Huntingdon, Tenn.

(1. "The Martian Revenge" was crowded out of the June issue of Wonder Stories only because of the combination of the two magazines. For the same reason we were unable to use "The Annihilator Comes." Both stories, we believe, will be published in the August issue

(*Continued on page* 183)

QUIT TOBACCO

No man or woman can escape the harmful effects of tobacco. Don't try to banish quickly the hold tobacco has upon you. Join the thousands of inveterate tobacco users that have found it easy to quit with the aid of the Keeley Treatment.

KEELEY Treatment For Tobacco Habit. Successful For Over 50 Years

Quickly banishes all craving for tobacco. Write today for Free Book telling how to quickly Free yourself from the tobacco habit and our Money Back Guarantee.

THE KEELEY INSTITUTE
Dept. L-701 Dwight, Illinois

RESHAPE your NOSE to beautiful proportions—while you sleep!

Thousands have used the ANITA Nose Adjuster to improve their appearance. Shapes flesh and cartilage—quickly, safely and painlessly. Doctors praise it. Results are lasting. Gold Medal Winner 1933. Write for 30-DAY TRIAL OFFER and FREE BOOKLET.

ANITA INSTITUTE, 782 ANITA Bldg., Newark, N. J.

MARRY! BIG DIRECTORY with descriptions and photos, mailed in plain wrapper for ten cents.

BONAFIDE CO., Dept. 58, Kansas City, Mo.

THE READER SPEAKS

(*Continued from page 180*)

of WONDER STORIES.

2. Back numbers of the QUARTERLY may be had at fifty cents each, except on a subscription plan or in large quantities.

3. We believe that the serial question has been settled, at least for the time being. We have found the great majority of our readers in favor of serials. We prefer to wait, before reopening the question, until the combined magazine has had a chance to function for a little while.

We appreciate the suggestions and will give them consideration.—*Editor.*)

Change a Mistake

Editor, WONDER STORIES.

I am a reader of your magazine SCIENCE WONDER STORIES, and as such am interested in it. The biggest mistake made in your first year of publication was the decision to change the name of your magazine. By calling your magazine WONDER STORIES you will degrade it to the level of other inferior magazines. The old title is one with which the magazine commands respect and one its readers need not be ashamed of, while the new is weak and inexpressive. I, for one, would be ashamed to champion the cause of a magazine with such a title, though its contents were as good as is the case with your publication. I think you will hear from other readers who think as I do and I will go so far as to prophesy a loss of sales rather than a gain. I know that my own group of science-fiction enthusiasts all heartily disapprove of the new title.

John L. Kline,
331 South Cliffwood Ave.,
Brentwood Heights, Cal.

(We appreciate Mr. Kline's sentiments. But we ask him to have faith. The publishers made the change only after mature consideration and the taking of all available evidence. They believe that the change is really to the interests of science-fiction and therefore the science-fiction enthusiasts that Mr. Kline represents. Since Mr. Kline has been a loyal reader we ask him to give the new title a chance first and then let us have him comment again. But we appreciate his point of view.—*Editor.*)

All Right With Him

Editor, WONDER STORIES

I have just received the June issue of WONDER STORIES. It certainly is a great improvement on the past issues.

As to the name, WONDER STORIES is all right with me. I agree with you that you will get more new readers by having omitted the word "science."

The paper is much better, making the magazine quite thin. As I am one of those who bind my numbers, this is an advantage.

Now as to the stories themselves. "A Subterranean Adventure" starts off fine. I hope

(*Continued on page 184*)

IF you have not as yet seen the SUMMER WONDER STORIES QUARTERLY

WATCH FOR THE SILVER COVER

Be sure to procure a copy from your newsstand.

ON SALE JUNE 15

This magazine specializes in interplanetarian science fiction and the Summer issue contains the following marvelous stories:

"Electropolis"
By Otfrid von Hanstein

"The War of the Planets"
By R. H. Romans

"The Tower of Evil"
By Schachner & Zagat

"The Eternal Man Revives"
By D. D. Sharp

"The Monsters of Neptune"
By Henrik Dahl Juve

At the left is a view of my drafting and specification offices where a large staff of experienced experts is in my constant employ. All drawings and specifications are prepared in my offices.

Protect Your Ideas

Take the First Step Today

If you have a useful, practical, novel idea for any new article or for an improvement on an old one, you should communicate with a competent Registered Patent Attorney AT ONCE. Every year thousands of applications for patents are filed in the U. S. Patent Office. Frequently two or more applications are made for the same or substantially the same idea (even though the inventors may live in different sections of the country and be entirely unknown to one another). In such a case, the burden of proof rests upon the last application filed. Delays of even a few days in filing the application sometimes mean the loss of a patent. So lose no time. Get in touch with me at once by mailing the coupon below.

Prompt, Careful, Efficient Service

This large, experienced organization devotes its entire time and attention to patent and trademark cases. Our offices are directly across the street from the U. S. Patent Office. We understand the technicalities of patent law. We know the rules and requirements of the Patent Office. We can proceed in the quickest, safest and best ways in preparing an application for a patent covering your idea. Our success has been built on the strength of careful, efficient, satisfactory service to inventors and trademark owners located in every state in the Union.

Strict Secrecy Preserved — Write Me in Confidence

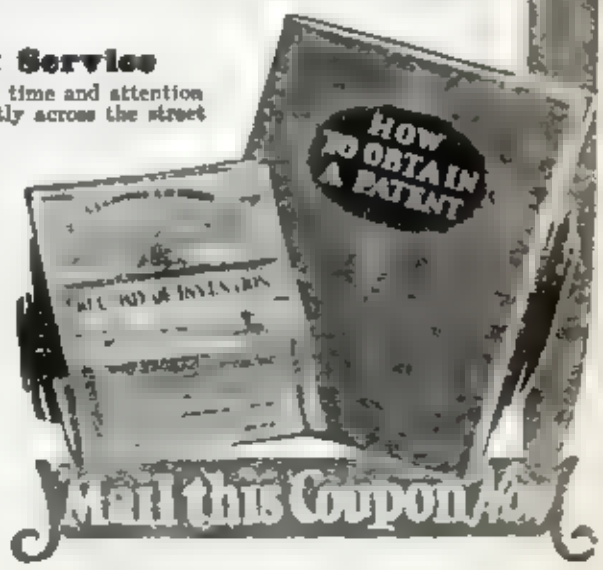
All communications, sketches, drawings, etc., are held in strictest confidence in strong, steel, fireproof files, which are accessible only to authorized members of my staff. Feel free to write me fully and frankly. It is probable that I can help you. Highest references. But FIRST—clip the coupon and get my free book. Do THAT right now.

No Charges for Information on How to Proceed

The booklet shown here contains valuable information relating to patent procedure that every inventor should have. And with it I will also send you my "Record of Invention" form, on which you can sketch your idea and establish its date before a witness. Such evidence may later prove valuable to you. Simply mail the coupon and I will send you the booklet and the "Record of Invention" form, together with detailed information on how to proceed and the costs involved. Do this NOW. No need to lose a minute's time. The coupon will bring you complete information entirely without charge or obligation.

Clarence A. O'Brien
Registered Patent Attorney

Member of Bar of Supreme Court of the United States; Court of Appeals, District of Columbia; Supreme Court, District of Columbia; United States Court of Claims.
Practice confined exclusively to Patents, Trademarks, and Copyrights



Mail this Coupon Now

CLARENCE A. O'BRIEN
Registered Patent Attorney
2084 Security Savings and Comm'l Bank Bldg
Washington, D. C.

— or —

Suite 1106, Woolworth Bldg., New York City

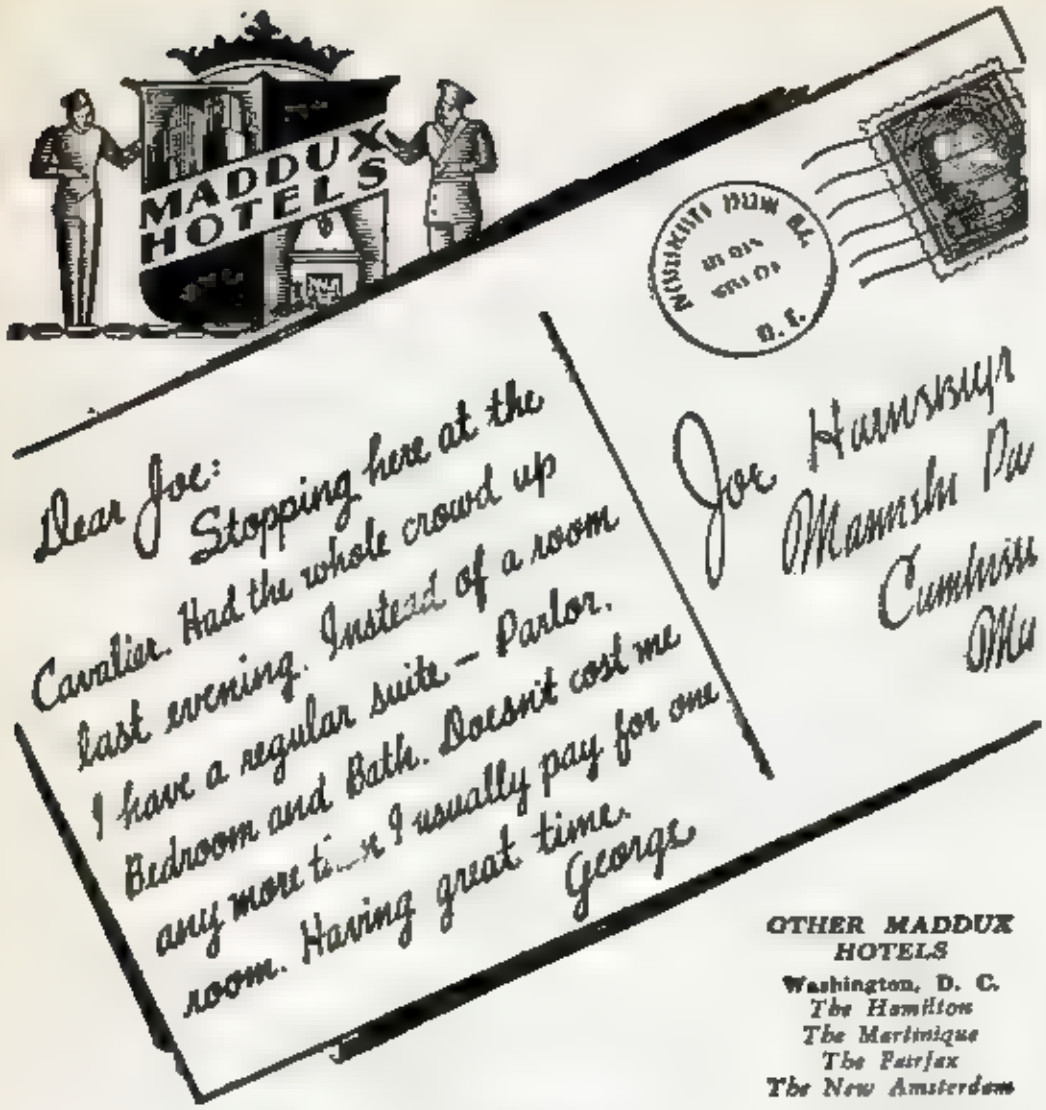
Please send me your free book "How to Obtain a Patent" and your "Record of Invention" form without any cost or obligation on my part.

Name .....

Address .....

.....

(Important: Print or Write name clearly and address office nearest you)



GEORGE talking it over with Joe later: "Yes sir; that's the way I'm going to live whenever I'm in Washington. No more 'one room stands' for me. Why it was just like home at the Cavalier—with that nice big suite. That Parlor makes all the difference in the world! Didn't have to meet 'the bunch' in the public rooms. And here's the best part of it, Joe, it doesn't cost any more—six dollars for the whole layout."

OTHER MADDUX HOTELS

Washington, D. C.
The Hamilton
The Martinique
The Fairfax
The New Amsterdam

Philadelphia, Pa.
The Fairfax
The Chatham

Pittsburgh, Pa.
The Fairfax

Buffalo, N. Y.
The Fairfax

RATES

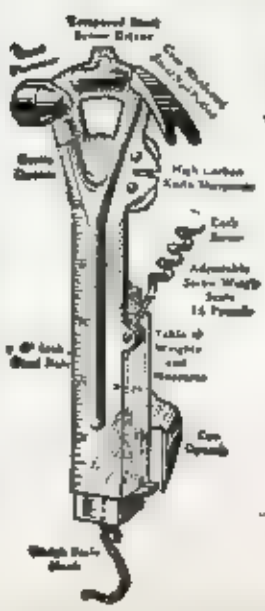
Single room and bath ..... $3-$5
Double room and bath ..... $4-$6
Parlor, bedroom and bath ..... $4-$8
Special rates by week or month

Ten Tools In One $1.00

A small but handy article which serves for every possible need of the all-round mechanic. Invaluable in any emergency.

An excellent combination of utilities for the household—every necessity featured: hammer, knife-sharpener, nail-puller, bottle-opener, screw-driver, can-opener, cork-screw and weigh-scale. Just glance at the illustration and you will see how really useful this article is. Only 10 in. high. Indispensable to autoists, campers, Boy Scouts, canoeists, picknickers, etc.

Price $1.00 Postage Paid. Be the first one in your town to own the "Ten Tools in One." Send coupon with your name, address, city and state with one dollar.



SEND FOR YOURS TODAY

Grenpark Company, SG-7
245 Greenwich Street,
New York, N. Y.
Enclosed find $1.00 for which please send me prepaid your "Ten Tools in One."
Name .....
Address .....
City ..... State .....

MAIL COUPON NOW!

TURN TO PAGE 191 and read the special announcement of the new scientific-technical-mechanical magazine which is now published.

THE READER SPEAKS

(*Continued from page* 183)

you will give us more stories by this author. Although I usually do not like Walter Kateley's stories, his latest, the "Incredible Monstrosity" is excellent, as is "Trapped in the Depths." The rest of the stories were also good.

I notice that you have changed back to the large type. I do not know if this is temporarily or permanent. However, I prefer the larger type, as it is easier to read, even though it does lessen the contents. Quality, not quantity, is what counts.

Success to the new and better WONDER STORIES.

Michael Fogaris,
157 Fourth St.,
Passaic, N. J.

(We have received letters stating all possible opinions on the change of title. Mr. Fogaris is apparently favorable, as Mr. Kline, whose letter is printed herewith, is unfavorable. But we ask our readers to have faith that we are acting for the best interests of all.

The larger type will be run in the future. The smaller was an experiment, and being open-minded, when we found that our readers did not care for it, we abandoned it. That experimental and open-minded attitude we hope to maintain.—*Editor.*)

The Perfect Story

Editor, WONDER STORIES:

Is it permissible for one writer to comment upon another writer's work? If so, I wish to make use of the Reader Speaks column to tell you what I think of the story "The Falling Planetoid" by L. R. Nathanson.

From start to finish it was a perfect story. Quietly, without undue fuss, Nathanson informs us that the earth is threatened with extinction. Immediately our interest is aroused and held in suspense until we learn that the threatened danger is cleverly averted.

I have read stories with a more complicated and interesting plot but never have I read anything in the pages of SCIENCE WONDER STORIES that could equal Mr. Nathanson's story for pure literary merit. If the readers noticed, they will see that it is entirely different from the usual run of stories. There is not a bit of conversation or breath-taking adventures, yet the story is a gem of its kind. Mr. Nathanson presents, with the ease of a master writer, the fears of the populace, the impotence of their leaders, the penny-pinching avarice and jealousy of the various nations. In fact, he covers every possible contingency that could arise under the circumstances and with quiet power and sly humor he shows up the world for what it is.

I wish Mr. Nathanson would tell us in "The Reader Speaks" column something about himself. I am sure the other readers are as interested as I am. Also, I would appreciate having a list of the other writings of Mr. Nathanson.

(Miss) M. F. Rupert,
6336 Dorchester Ave.,
Chicago, Ill.

(This is one of the many letters of applause for L. R. Nathanson's "Falling Planetoid" which appeared in the April 1930 issue of SCIENCE WONDER STORIES. This letter is all the more to be noted inasmuch as it comes from the pen of the author of "Via the Hewitt Ray" in the Spring 1930 SCIENCE WONDER QUARTERLY. Both Miss Rupert and Mr. Nathanson are excellent and they write stories with a moral. —*Editor.*)

On Sleep and the Sub-conscious

Editor, WONDER STORIES

A word in regard to your editorial on sleep.

First I would like to state my position. Some of your statements are in accordance with my personal experiences; the others I have not experienced, so that I cannot say yes or no to them. However, the theory that sleep is caused by the accumulation of poisons in the system, seems one upon which I can pass some kind of judgment. Sometimes after a day full of baseball, I would reach home, turn on the radio and immediately lose all feeling of fatigue. Even though my calves had been aching five minutes prior to the pressing of the switch, my feet would begin to twitch to the rhythm of the dance music, my head would clear and I would start dancing over the room alone.

A reason for my favoring the "tiring of the brain" theory is the fact that, after getting to

(*Continued on page* 185)

ELECTROPOLIS

By Otfried von Hanstein

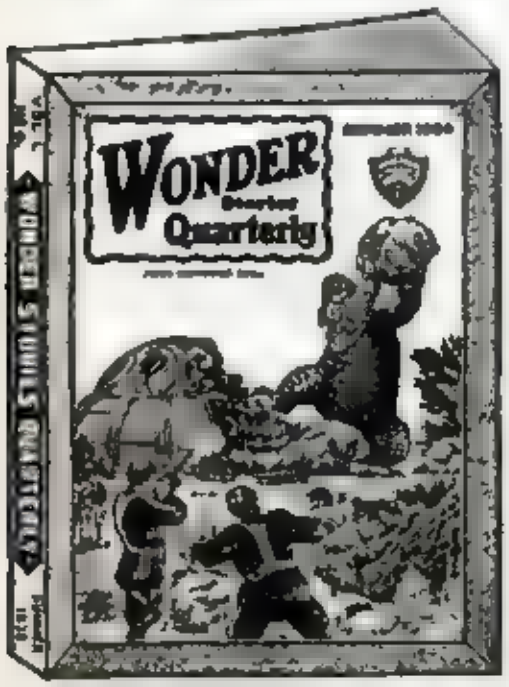
We are pleased to announce to our readers that we have purchased the American rights to "Electropolis," one of the greatest, if not THE greatest science story that has been published on the continent this year.

This story has been translated by us and published in its entirety in the QUARTERLY It is vastly different from anything that has ever been published in the annals of science fiction—it will cause a tremendous sensation.

This talented German writer has condensed into this story sufficient material to easily fill half a dozen ordinary novels of first-class science fiction. Radium, Air Transportation, Weather Control, World Automatons and dozens of other inventions fairly tumble over each other throughout the thrilling pages of this remarkable book.

Incidentally there is nothing contained within this story that is not strictly possible and within the bounds of future science.

144 *Pages*
4-Color Cover



On all Newsstands
50c. The Copy

Other Stories in This Issue

THE WAR OF THE PLANETS
By R. H. Romans

TOWER OF EVIL
By Nat Schachner and Arthur L. Zagat

THE MONSTERS OF NEPTUNE
By Henrik Dahl Juve

THE ETERNAL MAN REVIVES
By D. D. Sharp

A BIG SAVING!

The regular price of the QUARTERLY for one year's subscription is $1.75. By clipping out the coupon—filling it in and mailing immediately, you will receive the QUARTERLY for the next year at $1.25.

CLIP COUPON NOW!

WONDER STORIES QUARTERLY, WS-7
98 Park Place, New York, N. Y.

Enclosed find $1.25 for which please send me the next four issues of the QUARTERLY.

Name .....

Address .....

City ..... State .....

(Canada and foreign $1.50)

THE READER SPEAKS

(*Continued from page 184*)

bed as I did this Saturday night or rather Sunday morning at approximately four A. M., I got up in the morning perfectly refreshed and with a clear head. However, after an hour or two of activity, my head began to ache and I became dizzy and listless. Had sleep been caused by excess poisons in the system, I should have gotten up still feeling sleepy. Rather there was a likeness to a storage battery that is exhausted and allowed to stand idle after which it picks up and can be used for a little while and then goes dead again. (This has happened many times before.)

Now for a few words on the actions of the sub-conscious mind pertaining to myself. I am positive that my sub-conscious mind is awake and at work all the time I am awake. About it, when asleep, I do not know—never having experimented. To explain, I will give you the latest case of its actions. In the story, "Trapped in the Depths," you state that there is an error. I read the story with the view of finding it, but the story was so interesting that I lost track of my original intention. After finishing the story I still did not remember about the error. I listened to the radio and then started to walk towards the other end of my house. While on the way and without warning something asked me mentally, "And what happened to the nitrogen in the submarine?" It happened just like that.

I did not start a systematic elimination of all possible errors in the story. The fact is the story was not in my mind at all when this question popped up. The only way I explain it is through the sub-conscious mind. As I said before, this is one of many instances.

Should you have any other explanation for these occurrences will you please enlighten me?

Joseph Osofsky,
280 East Broadway,
New York City.

(Some of Mr. Osofsky's experiences are quite interesting, and they demonstrate one thing—as yet our bodies and minds are unknown organs to us and we can only conjecture about them quite blindly. Mr. Osofsky's experience—awakening after a little sleep to feel fresh and fit—and then suddenly relapsing, is parallel to what is known among athletes as the "second wind." A period of steadily lowering resistance during violent exercise is followed suddenly by a renewal of energy as though the body had suddenly tapped a new source of energy.

Furthermore, a mentally and physically tired man may suddenly have a renewal of life under the stress of great excitement—such as at a fire or a race. But the moment the stimulus has gone he relapses all the more violently. The moral is that there is not only our physical body to consider in these questions but also the thing known as mind and that series of electrical impulses known as nerves.

Naturally in the case Mr. Osofsky mentions, his subconscious mind, because, perhaps of a subconscious interest had been fastening on the fundamental error in the story all the time. And when it had its conclusions complete, it turned them over to the conscious mind.

The editor would be pleased to have any other comments on these interesting questions.—*Editor.*)

"I Will Never Read Your Magazine Again"

Editor, WONDER STORIES:

I have a request for my renewal subscription at hand. I will not subscribe to your magazine for the following reasons:

1. The stories are fantastic and highly improbable, you know this as well as I do.

2. 90% of the stories are *tripe*, no better than a western story thriller, just plain tripe, you know that too.

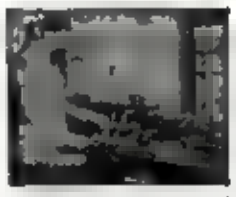
3. Your money-making policy, you have no ideals, you have no principles except one, make money.

4. Your, weak-kneed policy as regards Religion, which is, both Religion and Science are right, both cannot be right, they have always been at war since the time of Galileo and always will be. Science is gaining, Religion is losing.

5. The make up and the paper used in your magazine is awful, cheap as possible and still sell.

(*Continued on page 186*)

Let RCA INSTITUTES start you on the road to Success *in* Radio



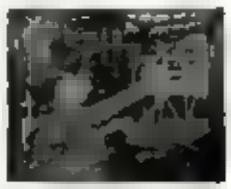
Radio Mechanic and Inspector, $1800 to $4000 a Year.

RADIO needs you ...That's why the entire Radio industry is calling for trained men...That's why thousands of men who answered these advertisements are now earning from $2,000 and up a year. Manufacturers, broadcasting stations, aviation and radio are now eagerly seeking trained RCA Institutes men ... Never before was there an opportunity like this in Radio.

This Is the Only Course Sponsored by the Radio Corporation of America

Broadcast Station Mechanic, $1800 to $3600 a Year.

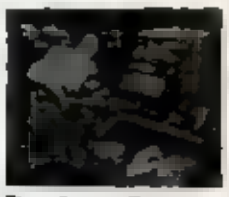
The RCA Institutes' Home Laboratory Training Course enables you to learn Radio in your spare time. In only an hour a day, you can obtain a thorough, practical education in Radio...You study right at RCA, the world's largest Radio organization. You learn Radio by actual experience with the remarkable outlay of apparatus given to every student. That's why every graduate of RCA Institutes has the experience, the ability and the confidence to hold a worthwhile Radio job.



Land Station Operator, $1800 to $4000 a Year.

Graduates of RCA Institutes Find It Easier to Get Good Jobs

SEND FOR THIS FREE BOOK ... Read about these practical RCA methods of training that have prepared hundreds of men for success in Radio. Everything you want to know about Radio. Forty fascinating pages, packed with pictures and descriptions of the brilliant opportunities in this world-wide profession. RCA Institutes will back you up to the limit. Our catalogue is yours, free ...SEND FOR IT TODAY!



Broadcast Operator, $1800 to $4800 a Year.

RCA INSTITUTES, INC.

A Division of Radio Corporation of America

Clip this Coupon NOW!

RCA Institutes, Inc., Dept. SRA-7
75 Varick St., New York, N. Y.

Gentlemen: Please send me your FREE 40-page book which illustrates the opportunities in Radio and describes your home laboratory-method of instruction.

Name .....

Address .....

State .....

Occupation .....

Book Prices Slashed!

AS LONG AS THE SUPPLY LASTS—

Sent Prepaid to You **35c** *the Copy* **3** *for* **$1.00**

No. 1

Here you will read the [illegible] long and [illegible] of secrets that happen behind the closed doors of a doctor's inner office. Written in diary form by Maurice Chideckel, M.D. Unbelievable but true.

No. 5

Dr. David H. Keller M.D. discusses such important topics as Sexual Physiology of the Young Man, Love and Marriage, The Normal Sex Life, Physiology of the Young Girl, Contraceptive Measures and dozens of other important topics from a scientific standpoint. Contains the best and most authentic thoughts on Life and Reproduction of interest to everyone — enlightenment on every page.

No. 4

So few people today know the schemes introduced by the racketeers—and the astounding success with which they extract tremendous sums of money from people. Only government inspectors and agents are familiar with their methods of swindling the unwary ways of the racketeers. In RACKETEERS dozens of outstanding schemes and the names of the leaders are exposed.

All of these books sold for 50c. a copy up to now. But in order to clean our stock we are selling them at 35c. a copy AS LONG AS THE SUPPLY LASTS.

If you ever wanted a fine book at a big bargain, *here is your last chance.*

NO FICTION

POPULAR BOOKS aim to educate you and entertain. They never contain fiction. They are all on SPECIAL SUBJECTS. Each book is compiled by EXPERTS. Every book contains far more matter than the usual $2.00 book, and gives you a wealth of material for the price of a high-class magazine.

All books are uniform in size—the large (9 x 12-inch) page which is a favorite with readers; heavy and durable paper only is used, and the type is selected for its readability. The covers are always in four colors and varnished to keep from soiling.

The majority of POPULAR BOOKS are profusely illustrated. FILL IN THE COUPON AND ORDER TODAY. 100 large pages per book.

We accept money orders, U. S. stamps or cash.

POPULAR BOOK CORP.

97G PARK PLACE NEW YORK

No. 2

The first complete book in the English language. Gliding is a sport that can be practised by everyone. It is the easiest, quickest and cheapest means of learning to fly. This book enables you to build and fly your own glider with little work and [illegible] expense. Written by expert gliders.

No. 3

SNAPPY HUMOR is a collection of the world's best wit culled from periodicals of every language. It contains the cream of the world's wit in French, German, English, etc., etc., with rich and snappy illustrations, also many varied articles. Over 750 Original illustrations. Plenty of laughs and thrills on every page.

No. 6

READ 'EM AND LAUGH — The pet story of each of a hundred world famous celebrities, personally interviewed by the author, each person is introduced by a comic introduction followed by an uproarious caricature by the author.

POPULAR BOOK CORPORATION,
97G Park Place, New York, N. Y.

Please send me the book (or books) selected below. I have encircled the numbers I desire. I enclose remittance for $ [illegible] at the rate of 50c a copy or 3 books for $1.00. You are to send the books to me postpaid (CANADA and FOREIGN 5c extra postage per book)

I have selected the following books 1 2 3 4 5 6

NAME . . . . . .

ADDRESS CITY AND STATE . . . . . .

THE READER SPEAKS

(*Continued from page* 185)

6. Your use of boys and girls to advertise your magazine free, through Science Fiction Week.

I have only read about one or two decent stories in your magazine in a year. I think Gawain Edwards is your best writer by a wide margin.

I surely will never read your magazine again,

Donald Peart.

(Naturally, an editor is distressed to receive a letter such as Mr. Peart's, although he cannot help but be grateful for Mr. Peart's candor. Such frankness is always, after all, quite helpful—and we are quite sorry to lose Mr. Peart as a reader.

We have received a great many letters on the science-religion question. A number of readers have criticised us for saying that there was "anything to be said for religion." These readers, such as Mr. Peart also stated that our attitude was dictated by a money-making policy. They further stated, as Mr. Peart does, that science is gaining and religion is losing. Now if all these things were true, it should have behooved us to stick with the winning side.

The only thing we have cautioned our readers in this controversy, is about closing their minds to both sides of the question. Critics of religion blame it chiefly for its intolerance. But those on the side of science and science only should be careful that they do not fall into the same error of intolerance. They should keep always a suspension of judgment—always ready to receive new evidence that might change their opinions.

We can only assuage our regrets at losing our reader by the fact that one can not please everyone—and as the old sage remarked "the only one who doesn't make bad friends is the one who doesn't make any friends."—*Editor.*

Read these thrilling stories in the July issue of

AMAZING DETECTIVE TALES

THE GREY SHADOW
By W. F. Hammond

A masterpiece of amazing detective fiction. A wealthy criminal employs the latest scientific inventions to hound the group of financiers which ruined his father. From beginning to end you follow the trail with Fiske Errol, the scientific man-hunter, until, by a stroke of brilliant reasoning, he destroys The Grey Shadow.

THE TOWER MYSTERY
By E. Zorbas

The victim of a ruthless girl disappears into thin air. Follow Detective Prawn's incisive deductions as he exposes an astounding crime.

HORROR HOUSE
By Walter Livingston Martin

Your blood will run hot and cold by turns, as apparently inexplicable crimes follow another in rapid succession. But science lights the path of the law—and the secret of HORROR HOUSE is revealed at the dramatic conclusion to a story that is "different" than usual. A weird yet logical story of an amazing killer.

THE MIND MACHINE
By George Eugene Key

We do not believe that any story which has been published in the last few years so plausibly explains the scientific developments we may expect to be commonplace by 1950. A story of murder and crime in future years—clearly and excitingly narrated.

THE MYSTERY OF THE PHANTOM SHOT
By Amelia Reynolds Long

A wealthy man is alone in his study. A shot is fired within the room—the man is found dead—yet no bullet has touched his body. "HOW? WHY? and WHEN?" are the questions you will ask yourself when reading this masterpiece of fiction.

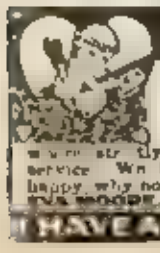
AND OTHER STORIES OF ABSORBING INTEREST AND EXCITEMENT.

The
SEASIDE HOTEL
Pennsylvania Avenue and Beach
ATLANTIC CITY, N. J.
1873-1930

NEW in construction and furnishings.
OLD in hospitable traditions. Famous for its home-like atmosphere.
The SEASIDE is a rare combination of a thoroughly modern hotel and a great private hotel with your friends about you. The mildest weather north of the southern resorts, open golf throughout the year and no snow.

COOK'S SONS CORPORATION

WONDER STORIES
is a combination of
SCIENCE WONDER STORIES
AND
AIR WONDER STORIES
retaining the best features of both



LONELY HEARTS

LET us arrange a romantic correspondence for you. Meet your sweetheart thru the world's foremost high class social correspondence club, a club for refined lonely people. Members everywhere. Strictly CONFIDENTIAL, efficient and dignified service. We have made thousands of lonely people happy, why not you? Write for Full Particulars.
EVA HOOPER, BOX 808, JACKSONVILLE, FLA.
I HAVE A SWEETHEART FOR YOU

SCIENCE NEWS OF THE MONTH

WALTZING MICE USED TO DETECT MONOXIDE GAS

Queer little Japanese waltzing mice have been put to good use by scientists who have found the mice even better than canary birds for detecting deadly carbon monoxide gas in the air, reports the U. S. Bureau of Mines.

Carbon monoxide is a highly fatal gas which has neither color nor odor, so that it can creep on a man unaware and overcome him almost before he knows what has happened to him. Small animals are affected more quickly than man by the same concentration of this deadly gas. Therefore they have been used to detect the presence of the gas in the atmosphere of mines and other places where it is a menace.

Because the effects of carbon monoxide poisoning are increased by physical activity, the waltzing mice, with their almost continuous and violent movements, show the effects of exposure to the gas much more quickly than any other animals and are therefore especially suitable for detecting the presence of the gas.

ECLIPSES AND COMETS ON 1930 ASTRONOMICAL PROGRAM

Two eclipses of the sun and two of the moon, one of each visible in the United States, the return of two periodic comets and perhaps several new ones; a gradual decline of sun-spots and solar activity, which will bring with it better radio reception,—these are some of the chief events on the astronomical program from 1930. Perhaps most interesting was the eclipse of the sun on April 28th; because it was the peculiar kind called a "central eclipse." An eclipse of the sun is caused when the shadow of the moon crosses the earth, and completely covers up the brilliant solar disc for people in the path traversed by the shadow. This is a total eclipse; but sometimes the shadow fails to reach the earth, and then the moon obscures only the center of the sun. A narrow rim of sunlight is seen around the dark lunar circle, and an "annular" eclipse is the result.

The eclipse of April 28th was both annular and total, paradoxical as that may seem. When the eclipse started, in the middle of the Pacific Ocean, the shadow falls just short of the surface of the earth at this phase; then it is annular. A few hours later, the eclipse reaches California, north of San Francisco. The earth being round, California is on the bulge towards the moon, and about 2,000 miles closer to it. By this time the shadow reaches the surface of the earth, and so the eclipse is total for a brief period. Then, as it passes on, the eclipse again becomes annular, crossing Hudson Bay and Labrador, and ending in the middle of the Atlantic.

PROVES WAVE THEORY OF MATTER

Professor J. A. Dempster, of the University of Chicago, has won a $1,000 prize offered by the American Association for the Advancement of Science for his work in proving the wave theory of matter, as advocated by Schrodinger, in distinction from the other atomic theories of Bohr and Langmuir.

Professor Dempster's experiments dealt with the behavior of the positive elements of hydrogen atoms when allowed to fall on a crystal. This experiment proves, also, the concept that atoms are made up of positive and negative charges—protons and electrons. Professor Dempster's experiment, something like the classic piece of research which showed the nature of the negative parts of the atom, dealt with the protons—with the atomic "heart." This center of the atom was found to pulsate very rapidly, at an incredible speed. Dr. Dempster based his work upon the results of research done by the German physicist Laue, who found, as far back as 1911, that crystals could be considered to have a regular arrangement of molecules. This arrangement acts like the structure of a silk umbrella when a distant light is seen through it—it diffracts the light. This was the first real evidence that X-rays were of a wave nature. Professor Dempster's experiments have shown that the same crystal arrangement acts in an analogous way on streams of positive hydrogen atoms, indicating that they, also, have a wave structure.

The discovery of the wave structure of the atom is one of the most important contributions to present-day physics. It is of immense value in the development of the theories of wave mechanics. (*Continued on page 188*)

. . . a dash to freedom fame and fortune!

A SULTRY NIGHT. In Boston's harbor there showed but a dim silhouette of steeples, warehouses, and feathery lacework of spars of this great town. An immigrant boy, starved and penniless, crept from the steerage hold to the deck and dropped into the murky waters of Boston Harbor. He swam ashore to a new life of adventure, hardships and trials in a strange land. . . . Such is the story of Joseph Pulitzer, publisher of the New York World.

It is but one of a hundred phenomenal stories that you will enjoy in this amazing 4-Volume Set—"PERSONALTY—100 PATHS TO SUCCESS" Crowded into each story is the essence of a great life—spectacular episodes and material more than sufficient for a full-length novel—the secrets of how a hundred every-day men and women like yourself achieved outstanding success by overcoming almost insurmountable obstacles.

These Books Will INSPIRE You to Greater Deeds

These four fascinating books are like a golden treasury. For the youth of America they hold a wealth of inspiration and guidance. Here are a hundred paths that have been blazed to the higher pinnacles of self-reward and progress.

In these four volumes have been placed the most intimate glimpses into the careers and characters of successful men and women. Some of these PATHS TO SUCCESS were blazed by men and women whose names are known the world over, others by some who are known only within the small circles in which they move, but in each individual story, replete with its own series of incidents and anecdotes, there is the essence of a thing well done, the stimulation, the inspiration that makes happiness, contentment, independence, and success.

Four Splendid Volumes

will be sent to you — simply fill out the coupon below and mail. The books will be shipped as soon as we receive the coupon with your remittance of $5.98, which is an unusual low price for these fine volumes.

These four books will be of inestimable help and inspiration to you. They will give you a new outlook on life, and will afford you many hours of the most pleasant relaxation while reading how 100 men and women, in various walks of life, attained almost undreamed of success by forging ahead in spite of tremendous obstacles.

Let us send PERSONALTY—100 PATHS TO SUCCESS today!

GREENPARK COMPANY, BG 7
245 Greenwich Street, New York City.
Gentlemen
I want to own the 4-volume set PERSONALTY 100 PATHS TO SUCCESS [illegible] here. I am [illegible] $5.98 [illegible] amount. Rush the set to me postage prepaid

Name

Address

City State

CLASSIFIED ADVERTISEMENTS

Advertisements in this section are inserted at the cost of ten cents per word for each insertion—name, initial and address each count as one word. Cash should accompany all classified advertisements unless placed by a recognized advertising agency. No less than ten words are accepted. Advertising for the August 1930 issue should be received not later than June 7th.

BOOKS

BOOKS OF ALL SCIENCES—read of comforting infinities—hopeful evolutions, also scientific reference work, etc. F. L. Jones, General P. O. Box 398, New York.

BUSINESS OPPORTUNITIES

MAKE $50.00 WEEKLY with $2.00 capital. Send 10c for plan. L. Mallan, 6372 Forward Ave., Pittsburgh, Pa.

CHEMICALS

BOOKLET OF EXPERIMENTS and chemical catalog, 15c. General Chemical Company, Box 397, Reading, Pa.

DETECTIVES

DETECTIVES Earn Big Money. Excellent opportunity. Experience unnecessary. Particulars Free. Write, George Wagner, 2190-B Broadway, N. Y.

INSTRUCTION

LEARN TATTOOING. Instruction catalog, dime. Miller, X431 Main, Norfolk, Virginia.

MAGIC

"BRAIN MAGIC," AMAZING mind reading novelty. 50c. Original and strikingly different. Neil Tasker, Shamokin, Penna.

MEDICAL

LOST VITALITY — The Specific Pill and Winchester's Hypophosphites, $1.00 per box or bottle, postpaid, literature free. Winchester & Company, Established 72 years, Box 237, Mount Vernon, New York.

MISCELLANEOUS

WILL PAY WELL for clippings or information about Death Ray. Dr. Evans, Grand Hotel, Santiago, Chile, South America.

TO THE MAN OR WOMAN seeking correspondence, matrimony or pen pals, we offer entirely different service. Box 1540, Sta. C, Los Angeles, California.

OLD GOLD WANTED

CASH FOR FALSE TEETH, DENTAL GOLD, discarded jewelry, platinum, diamonds, antiques. Send to Uhler Station B, Brooklyn, N. Y.

OLD MONEY WANTED

$5 to $500 EACH paid for Old Coins. Keep ALL old money. Many VERY valuable. Get Posted. Send 10c for Illustrated Coin Value Book, 4x6. Guaranteed Prices. We buy and sell. COIN EXCHANGE, Room 10, Le Roy, N. Y.

PHOTOGRAPHY

SEND ME 40c. and negative and receive by return mail beautiful 8x10 glossy finish enlargement. Other photographic work at lowest prices. Send for circular to Charles, 210 Chestnut St., Camden, N. J.

SONG POEM WRITERS

SONG POEM WRITERS "Real" proposition. Hubeler, D189X, 2104 Keystone, Chicago.

SONG POEM WRITERS. Composer of many "Hits" offers real opportunity. Ernest Shonfield, 2236 Olive, D-20, Pasadena, Calif.

RADIO BARGAINS

Low Power Transmitter adaptable for phone or [illegible] With plug in coils $14.75
Short Wave Sets, one tube complete with 5 coils, 14 to 550 meters 6.45
B Eliminator, Home Dry with 280 tube 180 volts, will operate up to ten tube set, fully guaranteed 8.75
A B C Power Packs 2.75
Power and Filament Transformers 4.00
Tubes UX type, 30 day replacement guarantee. No 210 $2.25, No 250, $2.35, No 24 $1.85, No. 245, $1.25, No. 226, $1.25; No 227 75c, No. 226, 65c No. 171 75c.
Chas. Hoodwin Co., 4240 Lincoln Ave., Dept. G-15, Chicago

SONG WRITERS!

Substantial Advance Royalties are paid on work found acceptable for publication. Anyone wishing to write either the words or music for songs may submit work for free examination and advice. Postage [illegible] necessary. New demand created by "Talking Pictures" fully described in our free book. Write for it Today—Newcomer Associates 751 Earle Building, New York, N. Y.

DO YOU WANT TO STOP TOBACCO?

Banish the craving for tobacco as thousands have. Make yourself free and happy with Tobacco Redeemer. Not a substitute, not habit forming. Write for free book telling of injurious effect of tobacco and dependable, easy way to relieve the craving many men have.

Newell Pharmacal Co. Dept. [illegible] Clayton, Mo.

FREE BOOK

AN interesting announcement of the New Science Fiction Series will be found on page 100 of this issue. Be sure to turn to it and read it carefully.

SCIENCE NEWS

(Continued from page 187)

EINSTEIN THEORY RECEIVES PRACTICAL APPLICATION

One of the main points of Einstein's Relativity Theory has received a practical application in a new engineering device. The theory that energy in any form has inertia, or mass—which means that a body moving at high velocities increases in mass—has been used in connection with a device for calculating the intensity of lightning striking an electric power line. In a cathode-ray oscillograph, the General Electric Company has used a new formula dealing with the deflection of the electron jet of the instrument. The amount of deflection indicates the voltage of a lightning surge on the power line to which the oscillograph is attached. A study of the intensity of these surges is necessary, so that engineers can equip the power lines with lightning arresters powerful enough to stop those of the highest voltage.

The instrument is adjusted to operate in less than one-millionth of a second, since it deals with lightning which approaches the velocity of light. The usual formula used for the deflection of an electron jet introduces an error of 5 per cent.; since it does not consider the relations between mass and speed at the tremendous velocities involved. Without the use of the Einstein theory the error of 5 per cent. is explainable only through the construction of elaborate equations. By making use of the Einstein conclusion, it is possible to develop a far simpler formula which explains the deflection and thus simplifies the use of the instrument. At high speed each electron acts as though its mass were increased.

ENGLISH ASTRONOMER FINDS NEW VALUE FOR ELECTRON'S CHARGE

A new value for the electrical "charge on the electron," one of the most fundamental of physical quantities, has just been announced by Prof. A. S. Eddington in *Nature*. About a year ago Prof. Eddington, who is Plumian professor of astronomy at Cambridge University, announced calculations made from theoretical considerations, showing the value to be 136. He now announces that his further study has shown the theoretical value to be 137. This brings it more nearly in accord with the classical experimental determination of the value by Dr. R. A. Millikan, American physicist and Nobel prizeman, who found it to be 137.1.

SAYS EARTH'S CRUST SHIFTS AS MOON PULLS

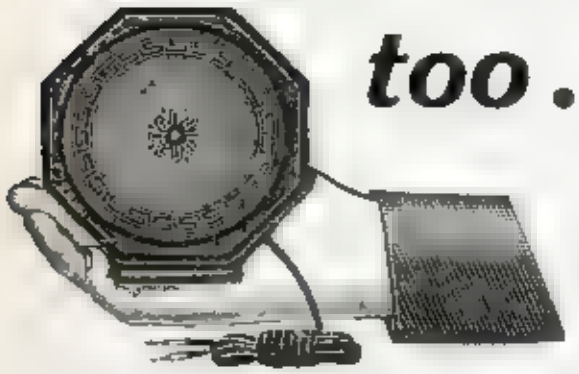
Dr. Harlan T. Stetson, noted astronomer, has stated that there is an actual shift in the crust of the earth as a result of the gravitational pull of the moon. Dr. Stetson has made an intensive study of the variation in latitude with the moon's position. While some movement of the crust of the earth has long been known to scientists, it was thought too small for measurement. Observations made and analyzed by Dr. Stetson show that the change of position may amount to five or six feet or more. Dr. Stetson has pointed out that changes in the position of the moon produce a change in the direction of gravity, causing the shift in the earth's crust.

EARTHQUAKE WAVES LIKE X-RAYS FOR EARTH STUDY

Just as the surgeon examines the interior of his patient's body by means of X-rays, so are scientists becoming able to study the interior of the earth by means of earthquake waves, produced naturally, or artificially by a dynamite blast. There appears to be not only a remote possibility but a high probability of the increasing use of seismic methods for the exploration of the hidden portions of the crust of the earth. The prospect has for us a sort of fascination, declared one worker. We are able as it were to hold the earth up to the light and look through it. The earth is as transparent to seismic rays as a ball of glass would be to light. The earthquake or dynamite blast is the flash, and the eye we use is the seismograph. So much progress has been made in the last two decades that we may look forward in the next few years to a great increase in our knowledge of our planet.

(Continued on page 189)

It's *yours* *and* FREE



too.

It's just the Midget Cone Speaker that makes radio programs more enjoyable—and besides its clarity of reproduction, its smallness of size makes it convenient to be placed in any room about the house — you get it *free,* at absolutely no cost. Many thousands are enjoying the advantages of this attractive speaker — why not you?

This speaker is yours — just for entering your subscription to WONDER STORIES for one year. Fill in the coupon below. Clip it out and mail it TODAY. There's not an overstock of these wonderful speakers so you must ACT QUICKLY!

Hurry! Fill in Coupon —
Mail it TODAY.

WONDER STORIES, Dept. B
98 Park Place, New York, N. Y.

My $2.50 for a year's subscription to WONDER STORIES is enclosed. I understand that a Midget Cone Speaker will be sent to me absolutely FREE

Name .....

Address .....

City ..... State .....

SCIENCE NEWS

(*Continued from page* 188)

STARS PULSATE OR TURN BUT CANNOT DO BOTH

Some stars, like our own sun, turn on their axes. Other pulsate like a gigantic heart. But the same star cannot do both, says Dr. Ross Gunn, of the Naval Research Laboratory in Washington. When a star turns, it acquires a magnetic field, and this prevents it from pulsating. The pulsating stars are not magnetic. This helps explain the astronomical mystery of the Cepheid variable stars, which are believed to pulsate, but which have also been supposed to be so large that they would not hold together if they were rotating.

NEW PROCESS ANALYZES TINY PARTICLES

A new discovery, of value to scientific research and to industry—the chemical analysis of particles so small that hitherto they defied all attempts to determine their composition—is explained by Dr. W. C. MacTavish, professor of chemistry at New York University. The "microvaporimetric molecular-weight method of analysis," by which one determines the composition of a fraction of a drop of liquid has determined the chemical constituents of a small drop of substance produced in an effort to find a rubber substitute; and it has found microscopic impurities in iron that was being galvanized. The method may be used in determining the genuineness of old paints and coins.

In demonstrating it the chemist analyzed about a third of a drop of liquid contained in a capillary tube. The tube was placed in mercury and then broken, releasing the liquid. The mercury was then heated until the liquid from the tube became gas. As the gas expanded it forced off an amount of mercury equal to its volume. By taking into consideration the temperature at which the gas was vaporized, together with its volume, its molecular weight was determined.

SPAIN PROPOSES 20-MILE TUNNEL TO AFRICA

Spain wants to be permanently joined with the land of her traditional enemies, the Moors, by the longest tunnel in the world—200 miles from end to end and 1,500 feet below water surface at the midpoint. Spanish engineers have discussed in their societies this proposed bond between Europe and Africa, and a preliminary shaft has already been sunk. Although the Straits of Gibraltar are only eight miles wide at their narrowest point, it is impossible to drive a tunnel there because of the great depth of the channel and the presence of rock too hard to bore. Further explorations of the consistency of the rock are to be made from the shaft by means of sound waves.

PHYSICIST CONFESSES BEWILDERMENT AT MODERN ADVANCES IN IDEAS OF MATTER

The scientifically inclined layman who feels bewildered at the host of new physical conceptions that have been brought forward in recent years, can now have the consolation that he is not alone in some such feeling. Speaking as vice-president of the Physical Section of the American Association for the Advancement of Science, Dr. P. W. Bridgman, of Harvard University, admitted a similar sensation.

"Many of us could, I believe," he declared, "confess to a feeling of breathlessness at the rapid changes of our present physical progress and some of us might even, in a moment of candor, admit a little resentment at our shortness of breath."

Some of the important landmarks in the progression of physical knowledge he listed as follows: Maxwell's electromagnetic theory of light; Einstein's special theory of relativity, and general theory of relativity, the quantum theory of Bohr, the matrix calculus of Heisenberg, the wave mechanics of Schrödinger, the transformation theory of Jordan and Dirac, the group theory of Weyl, and, finally the double quantization theory of Jordan and others. However, Dr. Bridgman said, such changes and new ideas in rapid succession are to be expected, for "whenever we extend the domain of experiment we must be prepared for unexpected new facts."

50c The Copy — *On All Large Newsstands*

Large Size (9 by 12 inches)—4-Color Cover—100 Large Pages

AMATEUR aviation constructors and aviation students—comprehensive chapters on construction of a monoplane and biplane with detailed practical hints on motors, instruments, gliders and other parts are found in this invaluable book. Replete with over 200 photographs, illustrations and working diagrams—also complete descriptions and photographs of latest types of planes.

If your newsdealer cannot supply you with a copy of AVIATION MECHANICS, *send fifty cents in U. S. stamps, check or money order to*

POPULAR BOOK CORP.
97G Park Place, New York City

PATENTS
TRADE-MARKS

DO NOT LOSE YOUR RIGHTS TO PATENT PROTECTION

Before disclosing your invention to anyone send for blank form "EVIDENCE OF CONCEPTION" to be signed and witnessed.

LANCASTER, ALLWINE & ROMMEL
(Registered Patent Attorneys)
475 Ouray Bldg., Washington, D. C.
Originators of forms "Evidence of Conception"

CHICAGO BLOTTED OUT OF EXISTENCE!

All life in Chicago, and then in Philadelphia, was blotted out in an hour by a plague. New York was threatened with immediate destruction, and the authorities, from the President down, were helpless to combat the threat menace. This powerful story of a bacteriologist's lust for power and the exciting fight to save civilization constitutes the theme of **THE DEATH LORD** by **Edmond Hamilton**—one of the greatest stories of science ever written. This and other scientific stories appear in the **July** issue of—

Weird Tales
The Unique Magazine

On sale at leading newsstands June 1st, or mail 25c to the publishers at 840 N. Michigan Ave., Chicago, Ill.

MONEY **MAKE BIG MONEY** MONEY

Just out. Lights gas instantly without sparks or flame. Sells like wildfire wherever gas is used. Retails for $1.

MYSTERY GAS LIGHTER

PACKED ON INDIVIDUAL CARDS WITH INSTRUCTIONS

Sample free or rush $9.00 per gross or $1.00 per dozen. NEW METHOD MFG. CO., Desk 8FG-7, New Method Bldg., Bradford, Pa.

The Greatest Sin of all is real IGNORANCE of the most important subject in the life of every man and woman—SEX

Away With False Modesty!

Let us face the facts of sex fearlessly and frankly, sincerely and scientifically. Let us tear the veil of shame and mystery from sex and build the future of the race on a new knowledge of all the facts of sex as they are laid bare in plain, daring but wholesome words, and frank pictures in the huge new library of Sex Knowledge.

"MODERN EUGENICS"

544 Pages of SECRETS

Everything a Married Woman Should Know—

How to hold a husband
How to have perfect children
How to preserve youth
Warding off other women
Keeping yourself attractive
Why husbands tire of wives
Dreadful diseases due to ignorance
Diseases of women
Babies and birth control
Twilight sleep—easy childbirth
How babies are conceived
Diseases of children
Family health guide
Change of life—hygiene
Why children die young
Inherited traits and diseases
What will you tell your growing girl?
The mystery of twins
Hundreds of valuable remedies

Secrets for Men—

Mistakes of early marriages
Secrets of fascination
Joys of perfect mating
How to make women love you
Bringing up healthy children
Fevers and contagious diseases
Accidents and emergencies
Hygiene in the home
Limitation of offspring
The sexual embrace
Warning to young men
Secrets of greater delight
Dangerous diseases
Secrets of sex attraction
Hygienic precautions
Anatomy and physiology
The reproductive organs
What every woman wants
Education of the family
Sex health and prevention

Girls— Don't Marry before you know all this—

The dangers of petting
How to be a vamp
How to manage the honeymoon
What liberties to allow a lover
Secrets of the wedding night
Beauty diets and baths
Do you know—
How to attract desirable men
How to manage men
How to know if he loves you
How to acquire bodily grace and beauty
How to beautify face, hands, hair, teeth and feet
How to acquire charm
How to dress attractively
Intimate personal hygiene
How to pick a husband

IMPORTANT!
This work will not be sold to minors.
When ordering your book, state your age!

Grenpark Company
245 Greenwich St.
Dept. SG-7
New York, N. Y.

Please send me "Modern Eugenics" SEALED, in plain wrapper. I am sending you $2.98 in accordance with your special half price offer.

My age is
Name
Address
City and State

BOOK REVIEWS

AIR NAVIGATION AND METEOROLOGY, by Capt. Richard Duncan, M.C. Flexible cover, 5¼" by 8", 246 pages, 80 illustrations. Price $3.00. Published by Goodheart-Willcox Co. Inc., Chicago.

This handbook is a very practical one and represents a valuable treatise which every student flier or those interested in the navigating of aircraft should certainly read carefully. The book is all the more valuable because it was prepared by Captain Duncan, a man who knows his subject in view of the fact that he held the rank of flight-commander in the R. A. F., and was instructor in navigation and artillery observation. The author opens his subject with the making and reading of maps, an art which every flier or embryo flier must know thoroughly. The next subject discussed is Latitude and Longitude; then we find Magnetic Variation, Deviation and Bearings discussed. Next we learn how to observe and determine the Drift, Dead Reckoning, etc. Directional Wireless and navigation by this means is covered, as well as Cross-Country Flying, the Aircraft Compass and how to use it, as well as Drift Indicators, the Earth Inductor Compass, Bank Indicator, etc. The hazard of Ice Accumulation on Planes is discussed and means for overcoming this danger. Then comes a section on Meteorology, with a chapter on Radio Direction Finding, followed by an appendix, Air Traffic rules, and a thorough index to all the subjects in the book.

ACES OF THE AIR, edited by Joseph Lewis French, with an introduction by Captain Eddie Rickenbacker. 320 pages, size 9 by 6¼ inches, stiff cloth covers. Profusely illustrated with photographs. Published by McLoughlin Bros., Inc., Springfield, Mass. Price, $1.00.

This book is a complete record of the progress made in aviation during the past two years. It is simply and interestingly written so that it appeals to and is understandable by young boys as well as adults. Many of the exploits of the aces of the air are in trace by the photographs in them and all other chapters are written by eye-witnesses or by those intimately associated with the events of which they write. In the whole sense, the book may be imagined by perusing the following chapter titles, taken at random: My Flight to 39,140 Feet, by Lieut. A. Soucek, U.S.N. "Flirting With Death in a Parachute" and "Around the World by Airship." Other chapters deal with the commercial, safety, teaching, legal, naval and associated problems of aviation, including the engineering question, which looms very large at the present time. Henry Ford (Hill Henry Ford, automobile fame) contributes a chapter on airplane engines, and Mr. Rose talks about bigger and better balloons. The development of the glider has not be overlooked and altogether, this is an interesting and very reasonably priced book.

WHEN THE U-BOATS CAME TO AMERICA, by William Bell Clark. 359 pages, illustrated, stiff cloth covers, size 6" by 8¾". Published by Little, Brown & Company, Boston. Price, $3.00.

This book gives an exhaustive account of the operations of German submarines along the Atlantic coastline during 1918. Though this may not be known to the general public, there were at one time six submarines operating in these waters, with the purpose of destroying American shipping and demoralizing American transport operation. Mr. Clark is a well-known historian, and his detached account of U-boat operations, free from any national prejudice, may be considered complete and authentic. It is illustrated with many unusual photographs that add much to its interest.

DIRECT-CURRENT ELECTRICITY, by L. Raymond Smith. 262 pages, illustrated, stiff cloth covers, size 5" by 7½". Published by the McGraw-Hill Book Company, New York. Price, $2.00.

Direct-Current Electricity is a carefully organized textbook on the fundamental principles and practical applications of direct-current electricity. The value of the volume lies in the fact that it does not assume any previous knowledge of electricity on the part of the reader; and therefore it may be used with profit by the beginner in physics and general science. As one of the *Industrial Physics Series* issued by the McGraw-Hill Company, the volume covers every phase of its particular subject, starting with the fundamental principles of direct currents—such as the application of Ohm's Law—and going through the heating effects of electricity, the various resistances, primary and storage batteries, the magnetic effects of currents, direct-current generators and motors, and dynamo losses and efficiency. There is a valuable appendix of useful information which will save the reader and experimenter a great deal of time.

THE EARTH IN THE HEAVENS, by L. Edward Johndro. 151 pages, illustrated, stiff cloth covers, size 6" by 8¾". Published by the Doherty Publishing Company, San Bernardino, California. Price, $1.00.

This companion volume to *The Stars*, by the same author, is sub-titled "Ruling Degrees of Cities, How to Find and Use Them." The book gives a bewildering array of facts and figures, and a great many astronomical charts, to enable the student to follow the reasoning of the author, who has worked out a system of his own for predicting the destiny of communities by their locations and by the times of their founding. As in the case of *The Stars*, scientists may be skeptical of the conclusions and formulas derived from previous events; but this book, like the other, makes fascinating reading.

BENVENUTUS GRASSUS DE OCULIS, translated with notes and illustrations by Casey A. Wood, M.D., LL.D. 101 pages, illustrated, stiff cloth decorated covers, size 6½" by 9¼". Published by the Stanford University Press, Stanford University, California.

This new edition of a curious old work on the eyes, is a very scholarly piece of research; and Dr. Casey is to be commended for it. While the theories of Benvenutus Grassus, who lived in the tenth century on the nature and character of the human eye, are of no scientific value at present, they are interesting as scientific curiosities. The volume, beautifully printed in old-face Caslon type, is to be treasured for its own sake.

ANTARCTIC ADVENTURES AND RESEARCH, by Griffith Taylor. 240 pages, illustrated, stiff cloth covers, size 5 by 8. Published by D. Appleton & Co., New York. Price, $2.00.

This volume forms part of the Appleton New World of Science Series. It is a modern attempt to portray, in the light of recent explorations, all that we know of the history, climate, geography and resources of the Antarctic regions. For one who is interested in this still practically unknown part of our earth, a knowledge of the locale is very necessary. For this task, the presentation convincingly of the meaning of Antarctica, Professor Taylor is admirably fitted, for he himself has been a leader in various expeditions to the frozen wastes. As a result we have a book which is not only scientifically accurate but also quite thrilling in the picturization of the meaning of the great vastness of Antarctic wastes.

LADIES! I positively guarantee my great "Seminal Relief" Compound. Safely relieves some of the longest, most obstinate, abnormal cases in 3 to 5 days. No harm, no interference with work. Mail $2.00; Double Strength $3.00. Booklet Free. Write to-day
DR. W. X. SOUTHINGTON REMEDY CO.
Kansas City, Mo.

PATENTS Write for Free Guide Book, "HOW TO OBTAIN A PATENT" and Record of Invention Blank. Send model or sketch and description of your invention for our Free Opinion whether it comes within Patent Office Rules. RADIO and AUTOMOTIVE TRIAL Cases a Specialty. *Prompt, Efficient Service.*
PAYMENT OF FEES IN INSTALLMENTS
VICTOR J. EVANS & CO., 923 - 9th, Washington, D. C.

EDUCATIONAL AND INSTRUCTIONAL NEW and used correspondence courses, and Educational Books, all schools and subjects sold at one-fifth original price. Also bought, rented and exchanged. Write for 4 months' subscription of 10,000 Bargains and copy of Educational World Magazine, 10 cents stamps.
EDUCATIONAL EXCHANGE CO.
147-W Michigan Avenue Detroit, Mich.

NOW — *on all newsstands*

Remember that EVERYDAY MECHANICS stands for practical mechanics in all its phases. And still more important, this magazine is the only one ever published where nearly all of the material published is edited with the view that its readers can cash in on the ideas.

15c

The Copy

HERE is the latest and most up-to-date magazine of its kind that has ever been published. Edited by Mr. Hugo Gernsback, veteran publisher of radio and scientific magazines for over 20 years.

The new magazine is chock-full of the latest inventions, new developments, how-to-make-it material, home mechanics, woodworking, metal craft, radio experimentation, etc.

But the important point about this new magazine is that it is thoroughly practical from beginning to end. No theories, no scientific accomplishments, no reading material that is not 100% practical in everyday life.

The magazine contains dozens of valuable articles showing how you can make things not only for yourself but how you can make money out of them immediately—that's the big thing.

The first issue of this magazine is now on all newsstands. Or if you wish to take advantage of several fine offers for a year or two-years' subscription, fill in the coupon at the right.

EVERYDAY MECHANICS PUBLICATIONS, INC.
96-98 Park Place New York, N. Y.

A Special Offer

and saving are made for readers of this magazine. EVERYDAY MECHANICS will be sent to you for one year at $1.00; two years at $1.90; and three years at $2.70. Remember each issue bought on the newsstand costs fifteen cents the copy.

Mail Coupon Today

EVERYDAY MECHANICS PUBLICATIONS, Inc.
96-98 Park Place, New York, N. Y. WS-7

I wish to take advantage of your special offer. Enclosed find.....for which send me EVERYDAY MECHANICS for.....years. Check one of the following.

( ) 1 year for $1.00 ( ) 2 years for $1.90
( ) 3 years for $2.70

Name .....

Address .....

City..... State.....

TRICKS—MAGIC—INSTRUCTION

For 25 years the management of this firm has sold merchandise by mail. This is our guarantee to you: We promise courteous treatment and prompt shipment.

Order Direct From this Page — **WE PREPAY ALL ORDERS OVER 50 CENTS** (Remit Five Cents extra for all orders below 50c) Remit by check, money order or U. S. Postage stamps. Canadian and foreign stamps not accepted. — **Money Refunded If Goods Unsatisfactory**

Floroscope

This is a fine imported combination microscope. Really two instruments in one. One end used for high magnification, such as seeing bacteria in milk or water. Other end to see parts of insects, flower specimens, etc. Finished in gold brass. Magnifies about 25 diameters.

No. 8518 Floroscope. Prepaid **65c**

Microscope

Here is a real high power imported microscope for instruction and laboratory work. Has regulation rotating light mirror. Has adjustable lens for correct focusing. With it come 3 specimen slides. Entirely brass. Packed in neat leatherette box. Magnifies about 50 diameters.

No. 8517 Microscope. Prepaid **$1.90**

Magnifier

This fine folding pocket magnifying glass, also called linen tester, is made entirely of gold lacquer brass. Has powerful lens that magnifies everything 10 times. Has fixed focus. Just open it and it is ready. When folded this magnifier occupies a space about as large as a quarter and twice as thick.

No. 8516 Magnifier Prepaid **35c**

Ooh-La-La Ring

Handsomely carved platinum finish. Looks just like any other ring. But, oh boy, wait till you look through the "VIEW." Strong magnifying glass shows French actress when viewed against light. Ring has large imitation diamond. When ordering enclose a strip of paper giving size of your finger.

No. 8511 Surprise ring. Prepd **35c**

Periscope

See what's going on behind your back with this Seebackoscope. Used like a magnifying glass. No one knows you're watching them. Gives you "eyes in your back." This article is made in molded bakelite and its size is 3"x1½".

No. 8506 Periscope. Prepaid **25c**

Microscope

A real high-powered imported pocket microscope for instruction and laboratory work. Has adjustable and automatic lens for correct focussing. Comes with one prepared subject and three specimen glass slides. Entirely made of lacquered brass. Packed in a neat leatherette box. Magnifies 40 diameters.

No. 8517 Microscope. **$1.40**

10c Compass 10c

Fine imported magnetic compass. ACCURATE Pocket size. Invaluable for hikers, automobiles. Often saves lives. Use it to tell live electric wires; make your own galvanoscope. Fully nickel plated. The actual article is about one-half again as large as illustration shown.

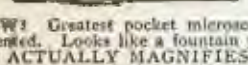
No. 8507. Compass Prepaid **10c**

X-Ray Tube

With this little instrument you apparently see through your hand, cloth, wood, stone and other objects. See the lead in a pencil, the stem hole in a pipe, the bones in your fingers. An amazing optical illusion that no one has ever satisfactorily explained. Startle the girls by showing them what this tube can do and let them imagine the rest.

No. 8590. X-Ray Tube. Prepaid.. **10c**

Wonderscopes



NEW! Greatest pocket microscope invented. Looks like a fountain pen and ACTUALLY MAGNIFIES 25 TIMES. Hair looks as big as a rope. See the pores in your skin. Has slide adjustable lens. For home, laboratory or shop. Full black enamel with clip. Its size measures 5"x½". Must be seen to be appreciated.

No. 8584. Wonderscope A— Prepaid **95c**

No. 8852 Wonderscope B—Same as above but adjustable so the amount of light available.

Prepaid **$1.35**

Luminous Paint

Make your own luminous articles. Paint watch and clock hands, electric light switches, push buttons, keyholes, house numbers, etc. 1,000 uses. Articles treated stand out brilliantly in dark. The darker the room, the more brilliancy.

No. 8508 Luminous Paint. Prepaid **25c**

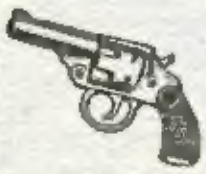
No. 8508-A Large Size ... **$1.00**

Nose Blower

The real article! Conceal nose blower in your handkerchief and blow into instrument while you pretend to blow your nose. Everyone stops and looks at you. There never was a terrible noise like it. Keep it up as long as you like.

No. 8510 Nose-blower. Prepaid. **10c**

Bluffgun



Bluff your friends with this gun. Made of composition metal handsomely nickeled. Exactly same size, weight and shape as real article. Fine to bluff burglars. Used also as desk paper weight. Size of this gun is 6¾" long and 3" wide.

No. 8583 Bluffgun. Prepaid. **65c**

Imp in the Bottle

A real Cartesian diver—Can you explain how it works? A little glass imp placed in a bottle of plain water and sealed with special rubber cap, dances up and down in the liquid at your will. Will perform unique antics. An interesting, amazing and scientific novelty. Bottle 4 inches high.

No. 8573. Imp in Bottle. Prepaid **35c**

Humanatone

Anyone can play the Humanatone. A unique and novel musical instrument played with nose and mouth combined. Produces sweet toned music similar to a flute. No fingering—no lessons. A little practice and you'll get the knack. Made entirely of metal. Nothing to get out of order or wear out.

No. 8537. Humanatone. Prepaid. **10c**

Microscopes

A REAL laboratory microscope that stands 6" high, comes complete with forceps, 2 prepared specimen slides and 2 blank glass slides, all packed in a cherry wood box with brass hinges and fittings. Made entirely of lacquered brass, with powerful lenses. Entirely demountable to facilitate cleaning. Has arc ends (open both sides) frame and rotary reflecting mirror. Made in three models for use in home, office, or laboratory.

No. 8645. Microscope. Magnifies 30 diameters. Prepaid **$3.75**

No. 8646. Microscope. Magnifies 70 diameters. Prepaid **$5.50**

No. 8647. Microscope. Magnifies 90 diameters. Prepaid **$6.75**

Big Magic Set

A chest of magical apparatus and directions for performing TWELVE AMAZING MAGICAL FEATS. An entire evening's entertainment can be given with them. Includes the Magic Vanisher, Cigarette Vanisher, Hoo Coins, Master Memory, Beads on String, Obedient Ball, Vanishing Watch, and many others. Biggest value ever offered, worth double the price we ask.

No. 8712. Big Magic Set. Prpd. **$1.00**

Real Pistol

Here's a real pistol, yet small enough to be used as a watch charm. Illustration is full size. Imported, best European workmanship. Excellent reproduction of standard pistol. Cut shows pistol broken open to load blank cartridge. When trigger is pulled, cartridge goes off with a loud BANG, that can be heard for a block. Pistol entirely made of steel, nickel plated. Handle is beautifully engraved. Octagonal barrel. Comes in box, with cleaning rod and 25 blank cartridges AT NO EXTRA CHARGE. (As explosives are prohibited to go by mail, pistol is sent express collect).

No. 8509 Pistol **$1.20**

No. 8509A Box of 25 Cartridges, by express collect **25c**

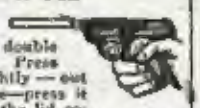
Opera Glass Charms

A pretty and unique watch charm. ¾"x1". Exact duplicate of real Opera Glasses. Powerful lenses that clearly magnify the view. Assorted views, scenic and French actresses. Fitted with ring to attach to watch chain. 2 VIEWS to each charm.

No. 8585. Bone Opera Glass Charm. Prepaid **25c**

No. 8586. Rolled Gold Opera Glass Charm. Prepaid **75c**

Cigaret Gun



NEW. Actually shoots cigarettes. New improved double action model. Press the trigger lightly—out shoots a cigarette—press it again, back flies the lid revealing it a cigarette case. Looks like a real automatic. Made entirely of metal, with oxidized stocks, barrel and fittings. The same size as the real article, and weighs but 12 ounces.

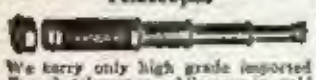
No. 8618. Automatic Cigarette Gun. Prepaid **$1.70**

Magic Sets

Here is the best selection of three magic sets at bargain prices. The contents of any of these three sets are valued at 60c. Requires no skill to perform, are entirely automatic and simple in operation. Each box contains five or more magic articles and complete instructions for performing the various feats.

No. 8705. Coin Tricks. Prepaid
No. 8706. Magic Set. Prepaid. **25c**
No. 8707. Card Tricks. Prepaid.
Or all three numbers. **65c**
Prepaid .....

Telescopes



We carry only high grade imported French telescopes. All come in gold brass lacquer. The most powerful telescope made. No. 8650 is covered with black Morocco leather. Brings object nearer ten times. This number has also brass dust cap and automatic eyeslide piece. Comes in imitation leather carrying case.

No. 8584. Telescope. One draw. 6¾". Prepaid **98c**

No. 8648. Telescope. Two draw. 9¾". Prepaid **$2.00**

No. 8649. Telescope. Three draw. 12½". Prepaid **$3.50**

No. 8650. Special Telescope, 4 sections. 13½" long. Prepaid **$4.95**

Blackstone's Magic

A big 96-page book, every trick illustrated. Instructions for over 50 MAGICAL TRICKS—25 MATCH TRICKS—7 OPTICAL ILLUSIONS and MANY OTHER interesting diversions. No skill needed—no practice—no special apparatus. Written by the famous magician, Harry Blackstone. Neatly bound with highly lithographed cover. Most astonishing value ever offered.

No. 8681. Book of Magic. Prepaid **25c**

NEW!! Telegraph 25c

For the astonishing small sum of 25c you can learn telegraphy. Any wide awake boy or girl can learn the telegraph codes with this little outfit within from 30 to 60 days. Gives loud signals perfectly—nothing to wear out. No batteries. The instrument consists of hard fiber base, mechanical sounder and telegraph key knob. Screw to table or carry it in pocket. Guaranteed to give exact reproduction of telegraph sounds just like regulation sets. We also furnish free a set of telegraph codes as shown, and full instructions of how to learn telegraphy.

No. 8525. Telegraph Set. Prepaid **25c**

Wizardeck

A full deck of 53 linen finish cards that you can use for play or magic. Deck is cut tapered, one end narrower than the other. Draw away card picked from the deck—and hundred of other amazing feats. Full instructions for performing 10 different tricks. Startle and entertain your friends. No skill required.

No. 8709. Wizardeck. Prepaid .. **75c**

Luminous Skeleton

A real startler. A big jointed figure of a skeleton, 12 inches high, that emits a ghastly radiance in the dark. Not a pretty sight but a big thrill producer. Gives you the creeps when you know about it—but a real surprise for those who come upon it unaware.

No. 8612. Luminous skeleton. Prepaid **15c**

3 for 40c

NEW!! Spinthariscope

Positively the most astounding scientific instrument ever developed. This instrument formerly sold from $1.00 to $50.00 upwards. Now it is possible to get it for a small sum. Witness actual destruction of thousands of Worlds by simply looking through the lens of the instrument. Actual radium is disintegrated before your eyes. You see the atomic bombardment plainly. Instrument is guaranteed to contain a minute quantity of radium. There is no more enthralling sight in the whole world. Nothing to wear out. Lasts forever.

No. 8624—Spinthariscope complete with instructions. Prepaid **65c**

Invisible Ink

A fluid in which you can write love letters, confidential messages, etc., without fear of detection. Remains entirely invisible until paper is heated. Used extensively by secret service operatives, detectives, etc.

No. 8528. Invisible Ink.—Per bottle, prepaid **15c**
(3 for 40c) .....

FREE!

Send for our new big fall catalog. Postal brings it.

Combination Cigar, Cigarette, Pipe Holder

A combination pipe, cigar holder and novelty view. A bottle shaped novelty that has a scenic view in the top, may be converted into a pipe, a cigar holder or a cigarette holder. Made of highly polished wood with aluminum fitting. Stands 6" tall when closed. A useful article and a real novelty. Assorted views, French actresses and scenic pictures.

No. 8393. Combination Cigar Holder. Prepaid **75c**

Cigarettehangs

Here boys is THE novelty. Box contains a dozen tiny wood pegs—but they are "treated." Push the sharp end of peg into cigarettes about 1/3 in. Pegs are so small they're invisible. Then offer your friends the cigarettes. BANG, BANG! they go off—Yet ENTIRELY HARMLESS.

No. 8529. Cigarettehangs Prepaid **15c**

Midget Harmonica

The smallest harmonica made, only 1¾" long. It is a practical musical instrument and a popular novelty. Has four single holes, eight perfectly tuned reeds, brass plates, nickel finish covers and ring to attach to your watch chain or fob.

No. 8532. Midget Harmonica. Prepaid. **15c**

SCIENTIFIC NOVELTY COMPANY, -247 Greenwich St., New York City

Chemistry Offers You

A Fortune

If You Want a Job with a Future, Get into Chemistry

T. O'Conor Sloane, A.B., A.M., Ph.D., LL.D.

Chemistry is one of the most ancient and honorable callings known to man. During the Middle Ages its adepts were the advisors of kings. Then it was called a black art and its followers were believed to have supernatural powers.

The chemist of today with his modernized knowledge has secrets a thousandfold more potent at his command. He is the brains behind hundreds of rich industries, which could not exist without his skill. Yet the field of Applied Chemistry has spread so widely that it is difficult to get enough good men to fill the available posts. A chemical expert is always sure of a good income, a respected and confidential position and a guaranteed future. He may also make himself a fortune, as hundreds of chemists have done before him. Did you ever hear of C. M. Hall? He was an American chemist who at the age of twenty-one discovered how to extract aluminum from clay. It was known that this could be done. It remained for someone to experiment and do it. There are innumerable other chemical problems today waiting to be solved. Mr. Hall died a few years ago leaving an estate of many millions of dollars.

WE CAN TEACH YOU AT HOME

In order to become a chemical expert you must have the proper training under experienced teachers. Our faculty knows just how to mold you into a skilful laboratory worker. The head of our staff is Dr. T. O'Conor Sloane, scientist, engineer and author of wide repute. He has had more than fifty years of teaching experience. Our course fits you for an immediate position in a chemical laboratory, and you do not have to give up what you are doing now to learn it. During evenings and week-ends you can work at home on the fascinating experiments and the delightfully simple but comprehensive lessons. A personal tutor is always ready to help you over difficulties and to answer all your questions. Most important of all—the teaching you receive is practical. You can actually use this knowledge to make money, as thousands have done before you.

SPECIAL ADDED EQUIPMENT

At no extra charge every student is given a complete cabinet of chemicals and apparatus for his own use. The illustration gives some idea of what it contains. There are over fifty distinct chemical reagents in the set. But in addition there is something which we have never offered before. The chemical expert needs sharp eyes. For much of his work no human eyes are keen enough. Every modern scientist resorts to the microscope, which is one of the most valuable instruments in home or laboratory.

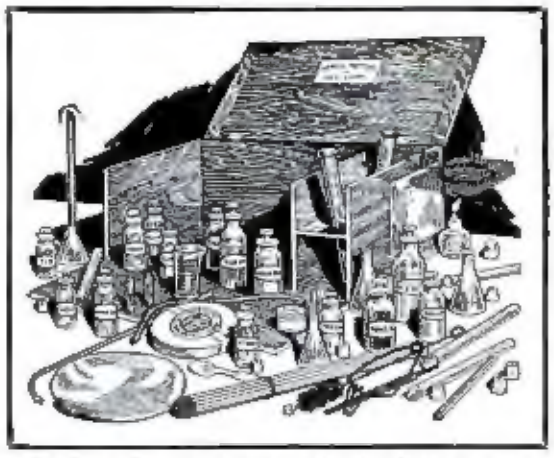
We Are Now Sending to Each New Student ABSOLUTELY WITHOUT CHARGE THIS VALUABLE MICROSCOPE

It is a beautiful instrument of fine German make and extremely sensitive. Any person not a student of our course may procure one through us at $25.00, which is somewhat less than the usual price, but to those who enroll the microscope will be given ABSOLUTELY WITHOUT CHARGE. With it you will receive a special lesson on its construction and use. The microscope is not loaned to you. It becomes your permanent possession along with all the other equipment and the lessons.

TUITION PRICE REDUCED

No advance in tuition price is occasioned by this newest addition to the apparatus we supply. In fact we have even reduced the fee, so that this splendid course and equipment are within the means of every individual who is interested in following Chemistry, whether as a career or merely as a hobby. Fee can be paid on EASY MONTHLY TERMS. The one price covers everything. There are no extras to buy.

MAIL THE COUPON TODAY FOR FREE BOOK



We give to every student, without additional charge, this chemical equipment, including fifty-two pieces of laboratory apparatus and supplies, and fifty-two different chemicals and reagents. These comprise the apparatus and chemicals used for the experimental work of the course. The fitted heavy wooden box serves not only as a case for the outfit but also as a useful laboratory accessory for performing countless experiments.

Diploma Awarded When You Graduate

Upon graduation every student is awarded our Diploma in Chemistry, certifying that he has successfully completed his studies. Your name on this certificate will be a source of pride to you all your life, as well as an aid in obtaining a position.

CHEMICAL INSTITUTE OF NEW YORK, INC.
Home Extension Division 7
16-18 W. East 30th Street, New York, N. Y.

Please send me at once, without any obligation on my part, your free Book "Opportunities for Chemists," and full particulars about the Experimental Equipment given to every student. Also please tell me about your plan of payment and the reduction in the tuition price.

NAME .....

ADDRESS .....

CITY..... STATE.....
FG-7-30

CHEMICAL INSTITUTE OF NEW YORK, INC.

16-18 East 30th Street **New York, N. Y.**

They dared Officer Kane to play

..and his music held them spellbound

ETHEL'S house party was at its height. Shrieks of laughter mingled with phonograph music could be heard outside.

Suddenly there came an ominous knocking at the door. Ethel ran to open it and—lo and behold—there stood Police Officer Kane.

"G-G-G Good Evening," gasped Ethel.

"I want to see the man of the house," thundered Kane.

"I'm sorry," stammered Ethel nervously, "but my father is not at home."

"Well, what's goin' on in here, anyway?" continued the officer sternly. "Sure and everyone on the block is complainin' of the noise. I've a good mind to arrest the lot of you."

Ethel was mortified—what a disgrace!

"Oh, please," pleaded Ethel, "please don't do anything like that, I promise—"

But Kane could restrain himself no longer.

"Don't worry lassie—you were all havin' such a fine time I couldn't help droppin' in. Go on—have all the fun you can," laughed the big good-natured policeman.

"Oh," sighed Ethel, greatly relieved, "how you frightened me. Won't you join us?"

Kane Joins the Party

"Ha," laughed Kane as the Victrola started again, "what's the matter with you all—playin' that canned music—can't any of you play this beautiful piano? Sure I'd like to give you a tune myself."

"I dare you to play for us," shouted Ted Strong quickly sensing a chance to have some fun at the policeman's expense.

Others chimed in, "Yes, do play for us, Officer." "Just one tune." "Yes, just one—that will be plenty!"

"I'm afraid I'll have to be goin'," stammered Kane, embarrassed as could be.

"Mr. Kane, I think you might play for me after the fright you gave me," smiled Ethel.

"Well, b'gorry, maybe I will," agreed the officer. And as he sat down at the piano everyone laughed and cheered. But the noise stopped instantly when he struck the first rollicking notes of Rudolph Friml's famous "Song of the Vagabonds." They were amazed at the way his large hands flew lightly over the keys.

"More—more." "Encore." "That's great—play another." They all shouted and applauded as the last notes of that snappy march song died away. Kane then started that stirring old soldier song, "On the Road to Mandalay." One by one the guests all joined in and sang.

Then Kane wound up with that popular dance number, "You're the Cream of My Coffee," and the whole crowd danced.

"Well," he laughed happily as they applauded long and loudly. "I'll have to be on my way now."

"Thank you for your lovely music," said Ethel. "You must be playing a good many years?"

"Sure and I haven't been playin' long at all." Then the questions came thick and fast. "How did you ever learn so quickly?" "When do you find time to practice?" "Who was your teacher?"

Kane Tells His Story

"Well, to tell you the truth I had no teacher. I've always loved music but I couldn't take regular lessons on account of my duties as a policeman. Then one evenin' I saw a U. S. School of Music advertisement in a magazine, tellin' of a new way of learnin' to play with no teacher at all. I didn't believe it myself but they offered a free sample lesson so I sent for it. One look at the Free Demonstration Lesson showed me how easy it was so I wrote for the whole course. My friends all told me I was crazy until I started playin' little tunes for them from real notes.

There were no tiresome scales or tedious exercises either. With these simple lessons I played real pieces almost from the start. Now I'm playin' classical numbers or jazz, havin' the time of my life."

* * *

This is not the story of just one isolated case. Over half a million people have learned to play by this simple method. You, too, can learn this easily understood way. Even if you don't know one note from another you'll grasp it in no time. First it *tells* you how to do a thing—then it shows you how in pictures—then you do it yourself and *hear* it.

You teach yourself—right at home—without any uninteresting finger exercises, tedious scales or other humdrum methods.

PICK YOUR INSTRUMENT

Piano	Violin
Organ	Clarinet
Ukulele	Flute
Cornet	Saxophone
Trombone	Harp
Piccolo	Mandolin
Guitar	'Cello

Hawaiian Steel Guitar
Sight Singing
Piano Accordion
Italian and German Accordion
Voice and Speech Culture
Drums and Traps
Harmony and Composition
Automatic Finger Control
Banjo (Plectrum, 5-String or Tenor).

Free Booklet and Demonstration Lesson

To prove how practical this course is, the U. S. School of Music has arranged a typical demonstration lesson and explanatory booklet which you may have Free. They show how anyone can learn to play his favorite instrument by note in less than half the time and at a fraction of the cost of old slow methods. The Booklet will also tell you all about the amazing new *Automatic Finger Control.*

So if you really want to learn to play—if you want a host of friends—to be popular—write for this Free Booklet and Free Demonstration Lesson.

Don't delay—act at once—fill in and mail the coupon below today—no obligation whatever.

(Instrument supplied if desired, cash or credit.)

U. S. School of Music, 507 Brunswick Bldg., New York City.

U. S. School of Music
507 Brunswick Bldg., New York City

Please send me your free book, "Music Lessons in Your Own Home," with introduction by Dr. Frank Crane, Free Demonstration Lesson and particulars of your easy payment plan. I am interested in the following course:

..... Have You Instrument?.....

Name .....

Address .....

City..... State.....